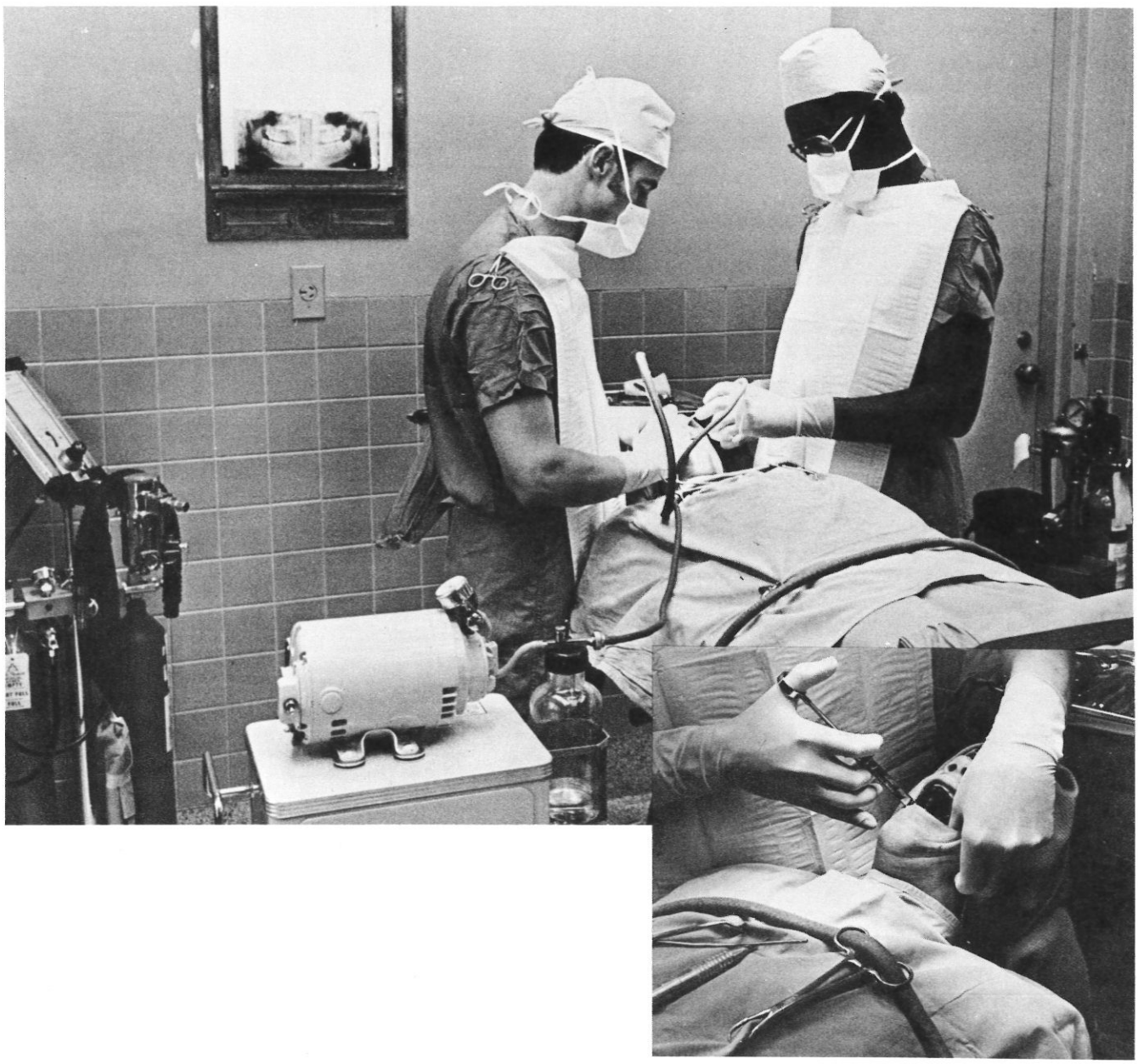
U. S. NAVY Medicine



August 1973

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See inside back cover for additional information.

The issuance of this publication approved in accordance with NAVEXOS P-35.

NAVMED P-5088

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Credits: All pictures are Official U.S. Navy Photographs unless otherwise indicated.

As the front cover reveals, photographer HM2 Earl McDonald caught LCDR J.E. Albright, DC, USN at work in oral surgery, assisted by DN James R. Boddy (right). For other action at the Naval Graduate Dental School, NNMC, Bethesda, see the feature article commencing on page 8.

The photo on page 2 reveals VADM D.L. Custis, MC, USN, the Surgeon General, reviewing a BUMED SITREP taped for distribution in the field. For more on BUMED SITREP, see feature article on pages 47-53, and our first published SITREP on pages 54-55.

The continued support of the Illustrations and Exhibits, and the Photography Divisions of the Media Dept., Naval Medical Training Institute, NNMC, Bethesda, Md., is gratefully acknowledged.

from the Chief

It is my intention to utilize this page frequently for personal comment on certain subjects of common interest to all Navy Medical Department personnel.

This leadoff topic concerns communication itself. We have available to us many channels of discourse and yet feel the need for additional modalities.

To this end, a monthly meeting here in the Bureau has been initiated with all program directors in attendance. Each attendee presents a concise updated progress report of all important projects under his or her cognizance. From this monthly "BUMED SitRep," two new communication patterns to the field will be produced:

(1) With this issue of U.S. NAVY MEDICINE there begins a monthly capsularized report on excerpts from the above described "SitRep" meeting.

(2) Additionally, selected topics will be covered in greater detail on ¾" videotape cassettes. These monthly productions will be forwarded to all major medical commands and activities having monitor capability. Videocassette player-monitor equipment has been centrally purchased and will shortly be delivered to over sixty medical and dental facilities.

Commanding Officers are asked to arrange for maximum showing of these BUMED SitRep cassettes in any manner best suited to local staff availability. Instructions will be given for monthly return of the cassettes for cost-economy reuse.

Obvious beneficial spinoff is provided in the distribution of this videocassette equipment. There is now a wealth of lending library cassettes on a wide range of medical subjects designed for use in a continuing medical education effort. The Naval Medical Training Institute, NNMC, Bethesda, Maryland 20014, provides a catalogue of some 175 such videotapes available on request. A second source of medical educational ¾" videocassettes is the Director, Television Division, Academy of Health Sciences, San Antonio, Texas 78234.

It is hoped the new BUMED SitRep effort will give all echelons of Navy Medicine more information, in a timely fashion, about what is going on in the Navy Health Care Delivery System. In addition, the "why" behind the "what" will be addressed.

Your suggestions regarding possible topic coverage or means for improvement of this new communication pattern will be appreciated.

The month of August has special significance for all members of the Navy Medical Department.

On August 31, 1842, an Act of Congress created the Navy Medical Department and established the Bureau of Medicine and Surgery, one of the five original Navy bureaus and the only one to retain the same name to this date. The Bureau, located on the site of the first Naval Observatory in Washington, D.C., is the administrative headquarters for the Medical Department.

On August 22, 1912, the Navy Dental Corps was established to provide necessary dental services to members of the Navy and Marine Corps. Since that time, Navy physicians and dentists have worked together to provide the finest medical and dental care for our sailors and marines all over the world.

The Army-Navy Medical Service Corps Act of August 4, 1947, established the Navy Medical Service Corps. Medical Service Corps officers provide administrative and management support, and complementary clinical support to Navy doctors and dentists.

The Navy Medical Department, composed of five corps — the Medical, Dental, Nurse, Medical Service, and Hospital Corps — has been called the guardian of the health of the Navy and Marine Corps. And rightly so. In addition to providing medical support to members of the Navy and Marine Corps, and their dependents, the department is also active in such diverse fields as aerospace and astronautical medicine, submarine and diving medicine, medical and dental research, medical education, and preventive medicine.

DEPARTMENT OF THE NAVY
ASSISTANT CHIEF OF THE BUREAU OF MEDICINE AND SURGERY FOR DENTISTRY
AND
CHIEF OF THE DENTAL DIVISION
WASHINGTON, D. C. 20390

SIXTY-FIRST ANNIVERSARY OF THE

NAVY DENTAL CORPS

22 August 1973

On the Sixty-first Anniversary of the Navy Dental Corps, I am pleased to express my appreciation for your loyal assistance and professional cooperation.

In the past year, you provided superb support to those who served our country, worldwide, both ashore and afloat. New dental facilities were built and staffed by dental officers who are dedicated to provide the finest dental care for our Navy and Marine comrades. Our research effort continued in the search for improved methods of dental health care delivery.

The sum of actions such as these have earned for each of you the reputation of professional excellence which our Dental Corps enjoys.

Let us go forward with the resolve to continue to build on this foundation.

Happy Birthday!

J. P. Arthur

J. P. ARTHUR
Rear Admiral, DC, USN

Dental Corps Flag Officers Change Commands

RADM George D. Selfridge, DC, USN, assumed command of the Naval Graduate Dental School, National Naval Medical Center, Bethesda, Md., on 28 Mar 1973. He relieved RADM Wade H. Hagerman, Jr., DC, USN, who has been assigned to the Navy's Bureau of Medicine and Surgery as Inspector General, Dental, and Deputy Chief of the Dental Division.

RADM Selfridge was born in Pitman, N.J. After receiving his D.D.S. degree from the School of Dentistry, State University of New York at Buffalo in Dec 1947, he accepted a commission in the Dental Corps. Initially assigned to Camp Lejeune, N.C., he was soon selected for internship training at the Naval Dental School and the Naval Hospital St. Albans, N.Y., during

CHANGE OF COMMAND.—Participating in the ceremony conducted at the Naval Graduate Dental School were (from left to right): CAPT F.N. Ellis, DC, USN; RADM W.H. Hagerman, Jr., DC, USN; RADM F.P. Ballenger, MC, USN, CO, NNMC; RADM G.D. Selfridge, DC, USN; and CAPT J.D. Vincer, CHC, USN.

FRONT AND CENTER.—RADM Selfridge, DC, USN (right) relieves RADM Hagerman, Jr., DC, USN (left).

1948 and 1949. Thereafter, he served in increasingly responsible assignments in various ships and shore stations, mainly with the Atlantic Fleet, until he returned to the Dental School in 1969. Assigned to head both the publications and audiovisual departments, he consolidated them into a new educational resources department and inaugurated an Independent Learning Center where students may select and study audiovisual educational materials at their convenience. He also helped in the design and development of two Master degree programs in cooperation with The George Washington University — one for graduate students, and the other for staff officers.

In Mar 1972, Dr. Selfridge was assigned as Executive Officer of the Naval Dental Clinic, Norfolk, Va., where he was involved in various programs designed to improve dental service to the fleet.

RADM Selfridge is a Fellow of the American College of Dentists and holds membership in the American Dental Association, the Academy of General Dentistry, and the Academy of Operative Dentistry.

A native of Tazewell, Va., RADM Hagerman received his doctorate from the School of Dentistry, University

Tripping the Line.

of Louisville, Louisville, Ky., in Jun 1945, and was immediately ordered to active duty at the Naval Training Center, Camp Peary, Va. On completing a subsequent tour of duty in USS *Steamer Bay,* he was released to inactive duty in Jun 1947 and entered private practice at Matewan, W.V. Since returning to active duty in 1950, he has held many responsible positions in the Dental Corps.

In Sep 1954, RADM Hagerman reported for a 10-month advanced course in dentistry at the Naval Dental School, on completion of which he remained on the School's staff until 1959. After a tour of duty at the Naval Support Activity, Naples, Italy, he returned to the School in Jul 1962, serving as chief of the fixed partial denture clinic and laboratory divisions, and as director of fixed partial denture courses. On 1 Jul 1969, he was assigned to the 4th Dental Company, Fleet Marine Forces, Camp Lejeune, N.C., and soon assumed command of the 22nd Dental Company. In Apr 1972, he was reassigned as Commanding Officer of the Naval Dental Clinic, Camp Pendleton, Calif., and on 4 Aug he assumed command of the Naval Graduate Dental School.

Admiral Hagerman is a Fellow of the American College of Dentists and a member of the American Dental Association, the American Academy of Crown and Bridge Prosthodontics, the American Academy of Gold Foil Operators, and the International Association for Dental Research.

The Naval Graduate Dental School conducts courses for Dental Corps officers in General Dentistry, Endodontics, Oral Diagnosis, Oral Medicine, Periodontics, Prosthodontics, and Oral Pathology. In association with The George Washington University, a Master of Science degree in Oral Biology is awarded to graduates of the first-year program. Continuing education courses in 13 areas of dental interest are conducted annually. Fifteen dental correspondence courses are administered and new courses are constantly under development. In addition, dental technician training is conducted in the fields of dental repair technology and dental laboratory technology (maxillofacial).

CHANGE OF COMMAND AT SAN DIEGO.—Participating in the ceremony conducted by the Naval Dental Center, on Preble Field at NTC, San Diego were (from left to right): RADM Kaires, DC, USN, CO Naval Dental Center; RADM J.W. Williams, Jr., USN; RADM M.G. Turner, DC, USN (now retired); and CAPT P.J. Grace, CHC, USN.

RADM Anthony K. Kaires, DC, USN assumed command of the Naval Dental Center on 29 Mar 1973 during ceremonies held on Preble Field at the Naval Training Center, San Diego, Calif. He relieved RADM Myron G. Turner, DC, USN, who had commanded the Center since 1970.

The Naval Dental Center, located at the Naval Station, has facilities for providing complete dental health care to authorized personnel and furnishes basic and advanced training for dental technicians. In addition, a continuing education program is conducted for Navy Dental Corps officers in the area.

The staff consists of 38 officers and 101 enlisted personnel; the student population is approximately 550 enlisted personnel. RADM Kaires, prior to assuming command, had served as the Inspector General, Dental, and Deputy Chief, Dental Division, in the Bureau of Medicine and Surgery, Washington, D.C. RADM Turner, who retired after 34 years of service, will make his home in La Jolla, Calif.

Oral Pathology and the Histopathology Service

Naval Graduate Dental School,
National Naval Medical Center,
Bethesda, Maryland.

The Naval Graduate Dental School provides all naval dental facilities, ashore and afloat, with a complete histopathology service for oral and dental tissues. Although oral pathologists practice a subspecialty of pathology, oral pathology has developed in the U.S., as a specialty of dentistry. This came about through a series of events that began in 1894, when the Curator of the Army Medical Museum invited the dental profession to consider the Museum a repository for its national collection of dental and oral specimens, and material. The association was formalized in 1933, when the American Dental Association sponsored the Registry of Dental and Oral Pathology within the Museum, the fourth of the 29 formal registries which now comprise the American Registry of Pathology.

The American Academy of Oral Pathology was founded on 7 Jun 1946, under the auspices of the Registry of Dental and Oral Pathology, and dentists and pathologists especially interested in the field were invited to attend its first meeting. Within two years, the Academy sponsored the American Board of Oral Pathology, which was approved by the American Dental Association's House of Delegates in Jan 1949. Requirements for examination were established as a minimum of two years of formal education at the graduate or postgraduate level, and three years of practice limited exclusively to the specialty.

THE ARMED FORCES INSTITUTE OF PATHOLOGY

In 1946, the name of the Army Medical Museum was officially changed to the Army Institute of Pathology, and the Museum became one of four departments of

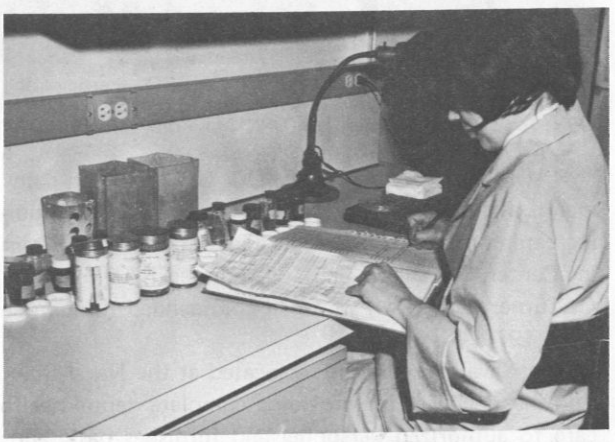

Figure 1.—Logging receipt of specimen.

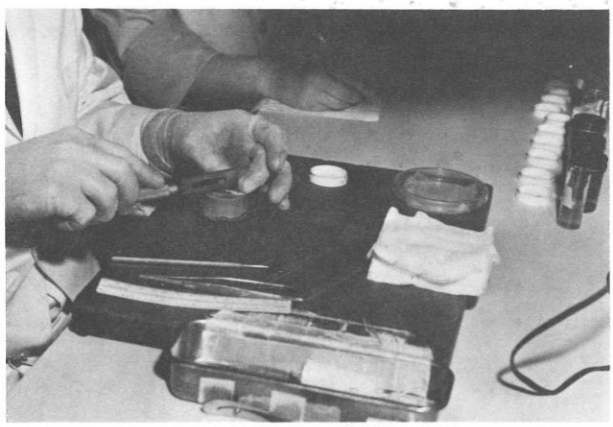

Figure 2.—Preparing specimen for processing.

Figure 3.—Placing tissue in Technicon.

the Institute, the others being the Department of Pathology, the Medical Illustration Service, and the American Registry of Pathology. On 6 Jul 1949, by Department of Defense Directive Number 5120.30, the Secretary of Defense reestablished the Institute within the newly created Department of Defense as the Armed Forces Institute of Pathology (AFIP), and it was proclaimed a joint agency of the three military departments. The directive also provided that the AFIP would be staffed by commissioned officers, assigned on a rotating basis by the Army, the Navy, and the Air Force, as well as by qualified civilian employees. Since that time, all of the oral pathologists in the Navy Dental Corps have had service at the AFIP; two have served as Chief of the Dental and Oral Pathology Division, and Registrar of the Registry of Dental and Oral Pathology.

Although the AFIP was established as the central laboratory of pathology for the Armed Forces and the Veterans Administration, each Surgeon General was to designate certain activities as histopathology centers, to provide diagnostic and consultation services for medical facilities in specified geographic areas. Accordingly, in 1950, the Chief of the Bureau of Medicine and Surgery designated the Naval Graduate Dental School as the Oral Histopathology Center, to provide diagnostic and consultation services on oral and dental-tissue specimens to Navy Medical Department installations in all naval areas (BUMED Circular Letter 50-50, of 8 Jun 1950). The latter document continued a previous designation made by BUMED Circular Letter 49-17 of 16 Feb 1949, which established the School as the center for the collection and diagnosis of oral pathologic specimens. The dual purpose of establishing the Center was to provide for the complete diagnosis of oral and dental-tissue specimens, to provide for the collection, storage, and preservation of valuable pathologic specimens for teaching and research purposes.

THE ORAL HISTOPATHOLOGY SERVICE

The functions of the Oral Histopathology Service are: (1) to provide microscopic diagnostic and consultation service on dental and oral-tissue specimens to Navy Medical Department installations in all areas; (2) to provide graduate and residency training, and conduct a continuing-education course in oral pathology, and; (3) to prepare training material in oral pathology for other naval dental activities.

Diagnostic and Consultation Service

Microscopic diagnostic and consultation service is provided for all Medical Department installations which are not adequately equipped or staffed to do this work. Specimens received for diagnosis are processed, and a written pathological report (Standard Form 515) is prepared and mailed within 48 hours. If the specimen proves to be malignant, a report is made immediately by telephone or, in the case of foreign shore activities or ships, by telegram. All specimens are examined by

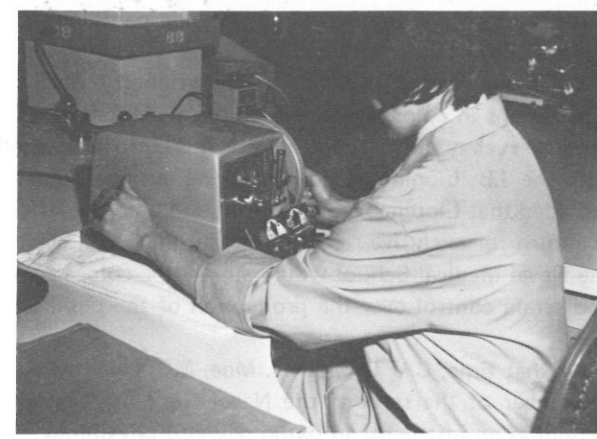

Figure 4.—Sectioning tissue with Microtome.

an oral pathologist certified by the American Board of Oral Pathology. Calcified specimens such as bone and teeth must be decalcified before sections can be prepared, thereby delaying the return report of the diagnosis until this can be accomplished. A microscopic slide of the specimen is subsequently returned if requested. The contributor of each specimen received is automatically provided a specimen-mailing assembly by return mail. This assembly includes a bottle of 10% buffered neutral formalin, an Oral Tissue Examination Form (NGDS-NNMC Form 6600/4), and a specimen-mailing container with an address label. It is emphasized that specimens removed from within bone should always be accompanied by pertinent radiographs, which are returned with the pathological report.

Since its establishment in 1950, the Oral Histopathology Service has accumulated complete records on over 22,000 biopsy specimens submitted by naval dental officers. A recent statistical survey of these records, conducted by CDR M.D. Callihan and LCDR J.R. Lohr, graduate officers at the Naval Graduate Dental School, revealed that more than 3%, or about one in every thirty lesions biopsied, was potentially life-threatening. The term "life-threatening" applied to lesions which, if untreated, might eventuate in death of the patient. This category includes not only malignant lesions but also lesions such as ameloblastoma and premalignant keratoses. The incidence of various oral lesions in the naval population was similar to that reported in the civilian population. However, lesions in the life-threatening category appeared to affect a somewhat younger age group in the military population, a finding which probably is attibutable to earlier detection.

The Pathology Atlases

In 1944, the Naval Medical School undertook publication of the *Color Atlas of Pathology.* Access to a wealth of pathologic material, and a staff which included not only a number of outstanding pathologists, but also lithographers trained in the art of eliminating flaws in the four separate negatives required to print illustrations in color, uniquely equipped the School to produce such a text. A contract was therefore negotiated with the J.B. Lippincott Company, the terms of which provided that Lippincott would print and bind the Atlas in return for exclusive rights to market the book, while the Naval Medical School would supply the color pages and retain control over the production of the publication.

At that time, CAPT Tilden I. Moe, MC, USN, was a member of the staff of the Naval Graduate Dental School as an instructor in pathology and physiology. In 1946, CAPT Moe began work on a companion

Figure 5.—Staining specimen.

publication, the *Color Atlas of Oral Pathology;* he had collected a number of illustrations and had begun work on the text before his transfer in 1949.

CAPT Moe's successor at the School, CAPT Robert A. Colby, DC, USN, continued work on the book. Professor Donald A. Kerr of the University of Michigan, and Professor Hamilton B.G. Robinson of Ohio State University assisted with the Atlas, providing certain illustrations as well as professional advice.

The J.B. Lippincott Company published the first edition of the *Color Atlas of Oral Pathology* in April 1956. The publisher had limited the first printing to 10,000 copies because of previous experience in marketing other dental texts; however, they underestimated popularity of the book, for the first printing was sold out before the end of the year. Lippincott then requested the Navy to furnish them with color pages for a second printing of at least 10,000 copies. However, the Surgeon General of the Navy decided the lithography department was too expensive to maintain, and it was disbanded. Lippincott then had the color work done

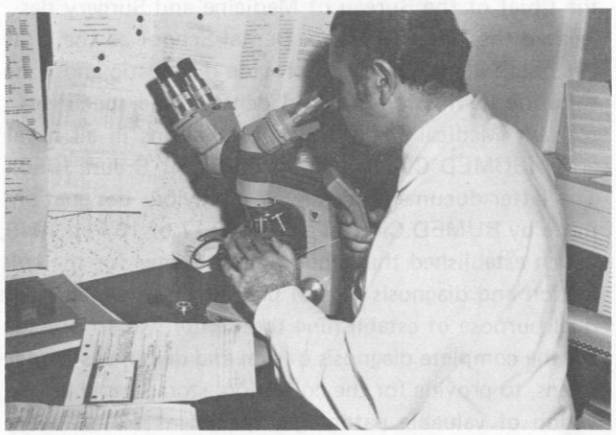

Figure 6.—Diagnosis on examination of slide.

commercially, and independently made a second printing of the first edition. Later, Lippincott proposed that a second edition be prepared, and at this point the Navy relinquished its rights in the Atlas to the publisher and the authors. A second edition was published in 1961, and a third edition in 1971.

Training Aids

Training aids prepared by the Oral Histopathology Service consist of study sets for individual and group use. Sets currently available include "Non-Neoplastic Oral Diseases," and "Benign and Malignant Oral Tumors." Each set consists of 25 microscopic slides, and an accompanying syllabus which contains: a brief clinical history of each case; a detailed description of each slide; the diagnosis; and a concise discussion of the clinical characteristics of the lesion, the therapy, and the prognosis. Sets are available for a two-week loan period, and may be obtained by addressing a request to:

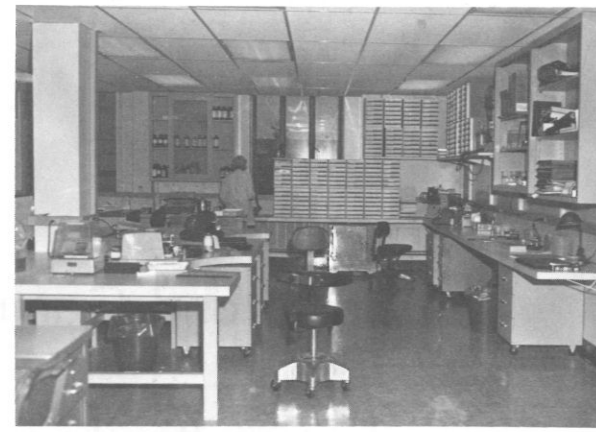

Figure 7.—Overview of the laboratory.

Commanding Officer (Code 5),
Naval Graduate Dental School,
National Naval Medical Center,
Bethesda, Maryland 20014.

THREE MILLION PRESCRIPTIONS.—DeWitt Blanchett (left), a government sales representative for Eli Lilly & Company, recently presented a symbolic apothecary jar to the Pharmacy Service of the Naval Regional Medical Center, Portsmouth, Va., in recognition of that activity having filled three million prescriptions since the advent of regionalization on 1 Jul 1971. Accepting the award were CAPT Charles W. Lewis, Jr., MC, USN (center), who was Deputy Director of the Naval Regional Medical Center at the time the presentation was made; and CAPT Joseph T. Horgan, MC, USN (right), Executive Officer of the Naval Hospital, Portsmouth, Va.

L-Aspartic and Gamma-Aminobutyric Acids as Biochemical Agents in Producing Epithelial Lesions

By CAPT Robert W. Longton, DC, USN,*
and
John S. Cole, III, Ph.D., Biochemistry and Oral Microbiology Division of Dental Sciences Dept., Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md.

BACKGROUND

In certain systemic diseases, such as arthritis, metabolic imbalances of amino acids are associated with altered tissue and tissue destruction.[1-10] The blood and urine of these patients contain high concentrations of individual amino acids. We have previously shown that increased systemic amounts of an individual amino acid, such as tyrosine, tryptophan, histidine, alanine, or citrulline, influence the extracellular products of fibroblasts including the production and composition of collagen *in vitro,* and *in vivo.*[11] Exogenous small metabolites, produced by microorganisms under certain nutritional conditions, may lead to metabolic imbalance in epithelial cells with consequent tissue destruction.

INTRODUCTION

The present study consisted of: analyzing the filtered material which was adjacent to clinically inflamed tissue, and filtered culture media containing pathogenic streptococci under several nutritional conditions; and comparing the recovered amino acids. Epithelial cells cultured *in vitro* were examined following exposure to individual amino acids produced by pathogenic microorganisms associated with inflammation, or to amino-acid combinations associated with clinical inflammation of epithelial tissue.

METHODS

Tooth-accumulated material (TAM) was collected adjacent to clinically inflamed epithelial tissue (gingiva),

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The research reported upon in the above article was supported by NMRI Research Project No. MF12.524.012.0019-AG31.

The opinions and assertions are not to be construed as reflecting the views of the Navy Department or the naval service at large.

and from areas adjacent to non-inflamed gingiva in humans. The weighed samples of TAM, suspended in isotonic saline, were filtered through a gel membrane (DIAFLO UM2). The filtrate, containing molecules with a molecular weight of less than 1000, was collected for amino-acid analysis. This filtrate was concentrated by lyophilization, and 0.5 ml of a 30 mg/ml sample in 0.2N sodium citrate (pH 2.2) was analyzed on a Beckman 120B amino-acid analyzer, under physiological conditions (PA 28 and PA 35 resins).

The influence of substrate on the production of small metabolites produced by *Streptococcus sanguis* 10556 and *Streptococcus mutans* 6715 was investigated. The substrates employed were: Todd Hewitt broth (THB); THB with 5% sucrose; THB with 1 mM ascorbic acid; and THB with 5% sucrose, and 1 mM ascorbic acid. Cultures were grown in 10% CO_2 and 90% N_2 at 37°C for 19 hours. Separation of microorganisms from culture media was accomplished by centrifugation at 12,000 xg for 30 minutes at 4°C. The cell-free system was filtered through a gel membrane as above; 0.2 ml of a 5 mg/ml sample in 0.2N sodium citrate (pH 2.2) was analyzed, as above.

Tissue cultures of Minnesota Esophageal epithelial cells (CCL4) were grown in Hanks' balanced salt solution with 20% human serum, 1% yeastolate, 2 mM glutamine, and 1:100 minimum essential medium (amino acids). Various amino acids, including L-aspartic acid (ASP) and γ-aminobutyric acid (GABA), were added to final concentrations of 1 mM in the tissue culture. Cells were grown aerobically at 37°C, and observed for cytopathic effects at 24, 48, and 72 hours.

RESULTS

Greater amounts of amino acid were found in the TAM which had been located adjacent to clinically inflamed tissue, than from the TAM which was taken from areas adjacent to clinically non-inflamed tissue. Five of the amino acids were mutually increased in the TAM; and in THB with 5% sucrose, 1 mM ascorbic acid, and *S. sanguis* or *S. mutans,* as shown in Table I. ASP was increased threefold in TAM which was adjacent to inflamed tissue. ASP was increased by *S. sanguis* and *S. mutans* under the influence of sucrose and ascorbic acid in THB. GABA (decarboxylated glutamic acid) was also increased by *S. sanguis* and *S. mutans* under these conditions.

1 mM ASP, or 1 mM GABA produced cytopathic effects in epithelial-cell cultures, as shown in Figures 1 and 2. There was increased refractility, decreased

TABLE I

Comparative Amino Acid Recovery from Filtered Cultures of Streptococci and from Filtered Tooth-Accumulated Material

Amino Acid	THB*	THB*	THB*	TAM†	TAM†
		S. sanguis Sucrose-Asc.	*S. mutans* Sucrose-Asc.	Non-Inf.	Inf.
		nM/mg			
Aspartic Acid	16	24	23	1.0	3.0
Proline	6	80	15	-	1.0
Glutamic Acid	33	61	50	1.0	5.0
Alanine	61	90	93	0.3	5.0
Lysine	63	80	76	-	1.0

*THB Todd Hewitt Broth
†TAM Tooth-Accumulated Material

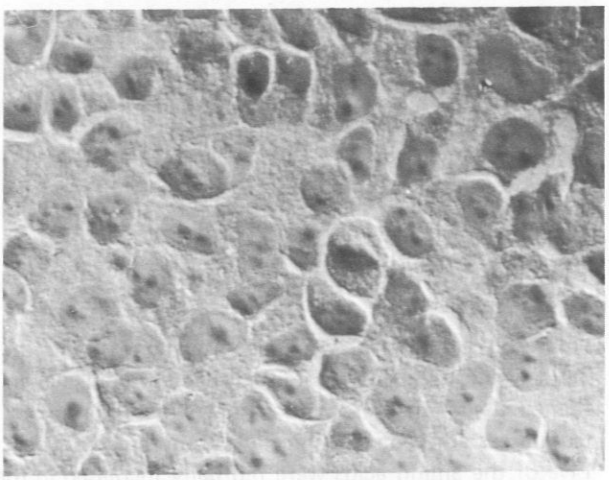

Figure 1.—Photograph of a 24-hour tissue culture of Minnesota Esophageal cells (CCL4) in Hanks' balanced salt solution with the usual additives for cell growth. The expected continuous layer with intercellular contact, generalized granular appearance, and uniform cellular distribution is seen.

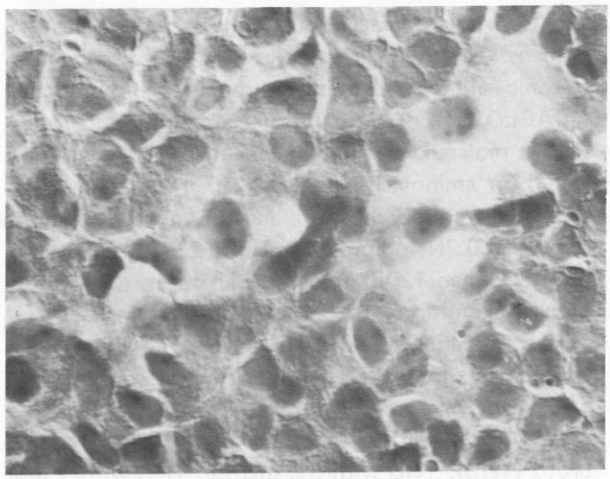

Figure 2.—Photograph of a 24-hour tissue culture with the addition of 1 mM L-aspartic acid. There is an increased cell refractility, some morphological changes, loss of cell contact, cell lysis, and a destruction of the cellular continuity. A lesion has been produced in the cellular layer of these epithelial cells. (Magnification 600X)

size, and lysis of epithelial cells in 24 to 48 hours. No other amino acids tested produced cytopathic effects when tested individually. Aspartic and γ-aminobutyric acids also produced cytopathic effects when they were used in combination with two or three other amino acids at 1-mM concentrations.

DISCUSSION

The mechanism(s) of action of these nonessential amino acids in producing lesions is as yet unknown. Eagle[12] noted that a number of amino acids caused partial inhibition of growth at two to five times their maximally effective levels in HeLa and L cells. Salzman[13] suggested that the presence of nonessential amino acids could alter the enzymatic composition and potential of tissue-culture cells. It is possible that amino acids, produced by bacteria, activate mycoplasma and viruses present in tissue such as epithelial cells, to produce cytopathology. No mycoplasma have been demonstrated by pleuropneumonia-like organism isolation techniques used on this cell line in our laboratory. It is difficult to establish unequivocally the absence of viruses in any cell line. However, no cytopathic effects were observed in control tissue cultures or in cultures treated with other amino acids. To our knowledge no precedent exists in the literature for viral activation by aspartic acid. While activation by aspartic acid remains a possibility, perhaps the most likely hypothesis is the observation by several authors[14-18] of an apparent competition between essential and nonessential amino acids for transport mechanisms. Cellular transformation of epithelial cells was obtained in our laboratory with cyclic AMP, producing forms which appeared similar to the spindle cells seen in Figures 1 and 2, and those produced in connective tissue.[19] Experiments are currently underway to elucidate the mechanism(s) involved in the toxicity demonstrated.

ASP was found to be increased in material which had originated adjacent to clinically inflamed tissue, and which was produced by pathogenic streptococci in THB with sucrose and ascorbate added. Numerous areas of cell lysis were observed in the continuous layer of Minnesota Esophageal epithelial cells upon addition of ASP at 1-mM concentration, and this effect was consistently reproduced. It appears that microorganisms are capable of producing altered levels of amino acids under nutritional conditions which would be available, to cause a metabolic imbalance in epithelial cells with which they are in contact. Microorganisms such as *S. sanguis* are usually present in tooth-accumulated material, and may release, or cause a release of small molecules from TAM, or from other microorganisms. The released small molecules, from TAM and microorganisms, appear capable of producing lesions in tissues which they contact. Since aspartic acid is a common factor throughout these experiments, it is tempting to speculate that it can function as an etiologic agent in the production of lesions in oral tissues.

SUMMARY

L-aspartic acid was present in material found adjacent to clinically inflamed oral epithelial tissue.

L-aspartic and γ-aminobutyric acids were increased in bacterial culture media when sucrose and ascorbic acid were added to cultures of streptococci. Increased refractility, decreased cell size, and lysis were observed when epithelial cells were exposed to L-aspartic or γ-aminobutyric acid in tissue culture.

ACKNOWLEDGMENTS

We wish to thank Dr. Herman D. Tow for his collection of tooth-accumulated material from human patients, and Mr. Vincent J. Berzinskas for numerous amino-acid analyses.

We are indebted to CAPT Tor Richter, MC, USN, and Emilio Weiss, Ph.D., for review of the manuscript.

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ALL-NAVY SKYLAB CREW SETS RECORD

The all-Navy crew of Skylab completed their record-breaking flight at 0650 P.D.T., 22 June when they splashed down in the Pacific Ocean 830 miles southwest of San Diego in a near-perfect landing. CAPT Charles "Pete" Conrad, the Skylab commander, CDR Paul Weitz, the Apollo Spaceship pilot, and CDR Joseph Kerwin, MC, USN, the crew physician, brought their space capsule down within six miles of the prime recovery ship, USS *Ticonderoga (CVS-14).* They were hoisted by crane aboard the carrier 38 minutes after splashdown.

During the mission, the three Navy astronauts flew 11.5 million miles, made 391 revolutions of the earth, and stayed aloft for 28 days 50 minutes, surpassing the old space-flight record of 23 days, 18 hours, and 22 minutes set by the Russian crew of Soyuz 11.—CHINFO NEWSGRAM (25-73).

THE MEDICAL SERVICE CORPS

Twenty-six Years of Service

In August 1972, the Navy Medical Service Corps celebrated its Silver Anniversary. At that time, a considerable number of well deserved accolades were presented to mark the tremendous accomplishments of this young Corps during its first quarter-century of dedicated service.

During the past 12-month period, however, as it completes its first full year of a second-quarter century of continuing service, this youthful and dynamic Corps of officers has distinguished itself once again by enhancing the image and responsiveness of the Navy's Health Care Delivery System.

During this past year, concerted efforts have been made to reduce the heavy administrative burdens encountered by our more senior Navy physicians and dentists. Increasingly, therefore, individual members of the Medical Service Corps are being selected on a highly competitive basis, to relieve physicians and dentists of these numerous non-patient-oriented responsibilities.

Highly talented and responsive Medical Service Corps officers have recently been designated as Commanding Officers of the Naval Dispensary, Seattle, Washington; the Naval Regional Medical Clinic, Washington, D.C.; and the Naval Dispensary, San Francisco, California.

Currently in the process of implementation are plans to: redesignate administrative-officer billets of naval hospitals as executive-officer billets, to be filled by responsible and capable Medical Service Corps officers; assign Medical Service Corps officers as executive officers of naval dental centers, clinics, and research activities; assign Medical Service Corps officers as Officers-in-Charge of selected medical facilities within the various regional medical centers; assign qualified Medical Service Corps officers as Assistant Officers-in-Charge of preventive medicine units; and recommend the assignment of Medical Service Corps officers to fill selected operational billets.

The professionalism and excellent sense of responsibility exhibited by members of this Corps has contributed in large part to implementation of the foregoing plans, and as of this date, the Navy has a total of 13 medical department activities with Medical Service Corps officers assigned as commanding officers or officers-in-charge; and the Office of the Surgeon General is actively pursuing implementation of additional assignments of Medical Service Corps officers to staff and command positions in many other naval medical and dental facilities.

Under the very capable leadership of CAPT Emmett L. Van Landingham, Jr., the Navy Medical Service Corps has now grown to 1720 members, approximately 80 of whom are women. With the exception of the Navy Nurse Corps, the Medical Service Corps enjoys the highest percentage of women officers of any other segment of Navy Medicine.

For your growth during the past year, for your active participation and cooperation in the Navy's equal opportunity programs, and for the professional and dedicated manner in which you are assuming positions of increasing responsibility in our Health Care Delivery System, *U.S. NAVY MEDICINE* joins with a host of others in wishing each member of the Medical Service Corps a happy and rewarding Twenty-Sixth Birthday!

DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20350

June 7, 1973

TO THE OFFICERS OF THE MEDICAL SERVICE CORPS

May I take this opportunity to extend to each of you my warmest personal greetings on the occasion of the Twenty-Sixth Anniversary of the establishment of the Medical Service Corps.

As each member of the Navy's Health Care Team strives to meet the ever-increasing demands for medical and dental services, the contribution and dedication of the members of the Medical Service Corps will become even more critical than in the past.

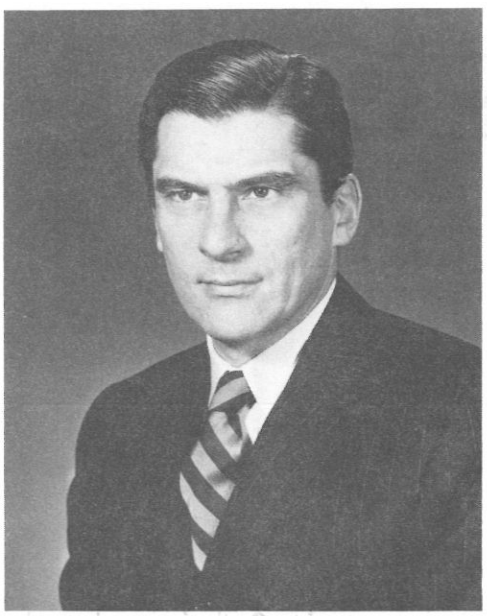
I offer you my personal appreciation for your many previous accomplishments and for the very positive "can do" spirit which you exhibit.

It is only your continued full-time effort and your loyal dedication to service that will enable the Medical Department to meet the demanding challenges of the future.

Congratulations to each of you on this anniversary, and my best wishes for a Happy Birthday.

John W. Warner

JOHN W. WARNER
Secretary of the Navy



CHIEF OF NAVAL OPERATIONS

TO THE OFFICERS OF THE MEDICAL SERVICE CORPS

It is with great personal pleasure that I extend congratulations to each of you on the occasion of the Twenty-Sixth Anniversary of the Navy Medical Service Corps.

In my many travels around the world, I have found that your corps of officers has earned an enviable reputation for dedication to duty and pride of service during the past twenty-six years; and it is obvious to me that many of the recent accomplishments in the health-care area can be attributed, in large part, to your loyal support and assistance.

Together with your Surgeon General, I am looking forward to your many future contributions to the Navy as plans are firmed for you to assume new duties as Commanding Officers, Executive Officers, and Officers-in-Charge of Health Care facilities.

I offer to you concurrently my deep appreciation for your past service and my best wishes in your expanded responsibilities as you enter your twenty-seventh year. Happy Birthday.

E. R. ZUMWALT
Admiral, U. S. Navy

31 MAY 1973

Dear Captain Van Landingham:

It is with great pleasure that I offer my personal congratulations to all officers of the Medical Service Corps on this twenty-sixth anniversary of the establishment of your Corps.

The contributions made by these talented officers in the field of hospital care administration and the sciences allied to medicine are acknowledged throughout the naval establishment. In the area of operational field medicine in support of the Marine Corps, they have assumed more complex duties and responsibilities including the expanded role as Commanding Officers of units historically commanded by Medical Corps Officers.

I commend you and your officers for past performances and I am confident that you will meet all new commitments and challanges successfully and with the espirit-de-corps traditionally associated with your Corps.

I extend to you my best wishes for continuing success.

Sincerely,

R. E. Cushman Jr

R. E. CUSHMAN, JR.
General, U. S. Marine Corps
Commandant of the Marine Corps

THE SURGEON GENERAL OF THE NAVY
WASHINGTON

TO THE OFFICERS OF THE MEDICAL SERVICE CORPS

In the twenty six years since the Medical Service Corps was established, its officers have proved by their performance in a wide variety of duty assignments, all over the world, that they are ready, willing, and able to assume broader responsibilities in managing the health care delivery system of the Navy.

As you enter your twenty-seventh year of service to the Medical Department our goal is to provide a number of you with the opportunity to do just that - to manage many of our medical and dental facilities and to make the decisions that determine their effectiveness and efficiency. These new assignments of expanded responsibility won't happen overnight, but happen they will and we shall monitor both your problems and your progress. I'm sure you will have a sufficient number of the former to challenge even your expertise and I know you will achieve the latter for your "can-do" esprit de corps, which has always been the hallmark of the Medical Service Corps, has helped us to achieve progress undreamed of in August of 1947.

With your continued support I expect more of the same and on the occasion of your twenty-sixth anniversary, I challenge you to meet my expectations. Happy Birthday!

D. L. CUSTIS
Vice Admiral, MC, USN

DEPARTMENT OF THE NAVY
ASSISTANT CHIEF OF THE BUREAU OF MEDICINE AND SURGERY FOR DENTISTRY
AND
CHIEF OF THE DENTAL DIVISION
WASHINGTON, D. C. 20390

TO THE OFFICERS OF THE MEDICAL SERVICE CORPS

On behalf of the Navy Dental Corps I wish to extend congratulations to the officers of the Navy Medical Service Corps on their Twenty-sixth Anniversary.

The Medical Service Corps has earned the respect of all members of the Medical Department team for your capable assistance in the achievement of our common goal of safeguarding and promoting the health of Navy and Marine Corps personnel. The many contributions made by your Corps to the overall management of dental health programs have been invaluable to the accomplishment of the mission of the Navy Dental Corps during the past twenty-six years. I have every confidence that the future will bring many additional opportunities for Medical Service Corps officers to participate in the further development of a viable dental health care delivery system for our Navy and Marine Corps.

Congratulations and best wishes for your continued success.

J. P. Arthur

J. P. ARTHUR
Rear Admiral, DC, USN

DEPARTMENT OF THE NAVY
DIRECTOR NAVY NURSE CORPS
WASHINGTON, D.C. 20372

TO THE OFFICERS OF THE MEDICAL SERVICE CORPS

Navy Nurse Corps officers throughout the world join me in sending our congratulations on the Twenty-sixth Anniversary of the establishment of the Navy Medical Service Corps.

This historical occasion provides us the opportunity to express our appreciation to each of you for the splendid administrative support and assistance you have given us during this past year. Your expertise, dedication to duty, and loyalty to the Medical Department and the Navy are truly exemplary. In the face of new and exciting innovations in providing health care to our Navy and Marine Corps personnel and dependents, we look forward to your continuing cooperation and excellent interpersonal relationships.

We are proud to salute the Medical Service Corps and to extend our best wishes for continued success.

Alene B. Duerk

ALENE B. DUERK
Rear Admiral, NC, USN

DEPARTMENT OF THE NAVY
CHIEF OF THE MEDICAL SERVICE CORPS
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D. C. 20390

As we approach our Twenty-Sixth Anniversary, it is with deep and meaningful reflection and joy that I extend to each of you my heartfelt appreciation for the many contributions you have made in the formulation and development of the Navy's modern Health Care Delivery System.

This will be my last year to celebrate this occasion with you as Director of the Medical Service Corps; and it is because of the active cooperation exhibited by each of you that I am able to look back with a deep sense of pride at the myriad of tasks and endeavors which have been brought to fruition in the past few years.

I have no doubt whatsoever that the dynamic and innovative accomplishment of the past will be dwarfed by your future role in our viable Health Care System. Many of you will be contributing your services, energies, and expertise as Commanding Officers, Executive Officers, and Officers-in-Charge of selected medical and dental facilities; and the regret and sorrow that I feel in leaving you pales into insignificance when I reflect on the increasingly responsible positions of leadership that await you in fulfilling and enhancing the Health Care Team's ministry of healing.

My personal congratulations to each of you, and my best wishes as we enter our twenty-seventh year.

E. L. VAN LANDINGHAM, JR.
CAPTAIN, MEDICAL SERVICE CORPS
UNITED STATES NAVY

Evaluation of a Nosocomial Infection Program

By LT J.H. Lewis, MSC, USNR,
Naval Regional Medical Center,
Philadelphia, Pennsylvania.

INTRODUCTION

An earlier report described the problem of nosocomial infection at Naval Hospital Philadelphia (NAVHOSPHILA) during July through December 1971.[1] The study indicated that 97 patients were reported to have acquired an infection from hospital sources. It was estimated that these infections required the full-time attention of five Nursing Service personnel, and resulted in a total excess treatment cost of about $68,000. However, review of infection-reporting procedures revealed the likelihood that significant under-reporting existed. Consequently, the impact of infections on the patient population and the hospital's resources was considered to be greater than that indicated by the reported experience.

The first report provided a statement of the problem. The following report is an evaluation of the mechanisms for control and prevention of hospital-acquired infections.

EVALUATION APPROACH

The Naval Hospital Philadelphia (now known as the Naval Regional Medical Center or NAVREGMEDCENPHILA) nosocomial infection program is a complex of resources, activities, and objectives dedicated to the identification and elimination of morbidity and mortality resulting from infections contributed by the hospital environs. It was initially hoped that the evaluation could be completed by a comparison of planned and actual program performance. However, planned program objectives were unclear; because of fragmented activities, the use of manpower with primary responsibility for non-program activities, and the difficulty of identifying program costs, comparison of the actual and planned programs was abandoned. Instead, the evaluation was approached through comparison with a model program developed at Naval Regional Medical Center, Oakland (NAVREGMEDCENOAK).

NAVREGMEDCENOAK personnel are either preventive medicine technicians (NEC8432) or Medical Service Corps officers (NOBCO855) with professional training in public health sciences; they are actively engaged in developing a program model for eventual implementation at other naval regional medical centers. The data provided by NAVREGMEDCENOAK personnel indicate that their operating program is effective.

The Program Goal.

According to Deniston, et al.,[2] program success is a function of effectiveness: the level of attainment of the planned-program goal. The goal of the NAVREGMEDCENPHILA program is defined as follows:

The opinions or assertions contained herein are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

"The presence of various kinds of infection always exists; however, keeping these infections to an absolute minimum is of paramount importance."*

Ideally, if no constraints were to exist, the goal would simply be "complete elimination of the problem." However, the literature suggests confining the focus of infection programs to the elimination of infections related to hospital practices, such as aseptic technique, sanitation, and antibiotic utilization.[3,4,5,6] The reason for limiting the scope of the program is based on the nature of some nosocomial infections. For example, some endogenous infections develop unavoidably as a result of antimicrobial therapy. Ameliorative actions against these infections are more properly related to developments in treatment identified with medical research programs, not hospital infection programs.

Another aspect of the goal is the lack of specification. Theoretically, if the rate of infection due to "hospital practices" were known, a specific goal could be established. However, this information is not currently available.

*NAVHOSPHILA INSTRUCTION 5420.3, 5 Sept 1969.

It is assumed that the discussion presented above is generally applicable to most program goals. Although the goal remains unspecific and limited in scope, the expectations of patients, providers and accreditation bodies clearly demand maximum effort.

Objectives.

NAVREGMEDCENPHILA nosocomial infection program objectives were derived from, and reflect the Infection Control Committee functions;* they may be categorized under three rubrics — initial sub-objectives, intervening sub-objectives, and program goal.

Figure 1 identifies each objective and suggests a time sequence within which the sub-objective must be attained before the program goal is accomplished. At the left are four initial sub-objectives: studies of aseptic technique, sanitary practices and antibiotic utilization, and compilation of attack rate data. Simultaneous completion of these tasks is required before each subsequent objective can be attained. At the extreme right is the program goal: nosocomial infection reduced to an absolute minimum. Between the initial sub-objectives and the ultimate goal are five intervening phases that evolve in the order indicated. Discussion with NAVREGMEDCENOAK personnel indicates that the objectives and goal of each program are similar.

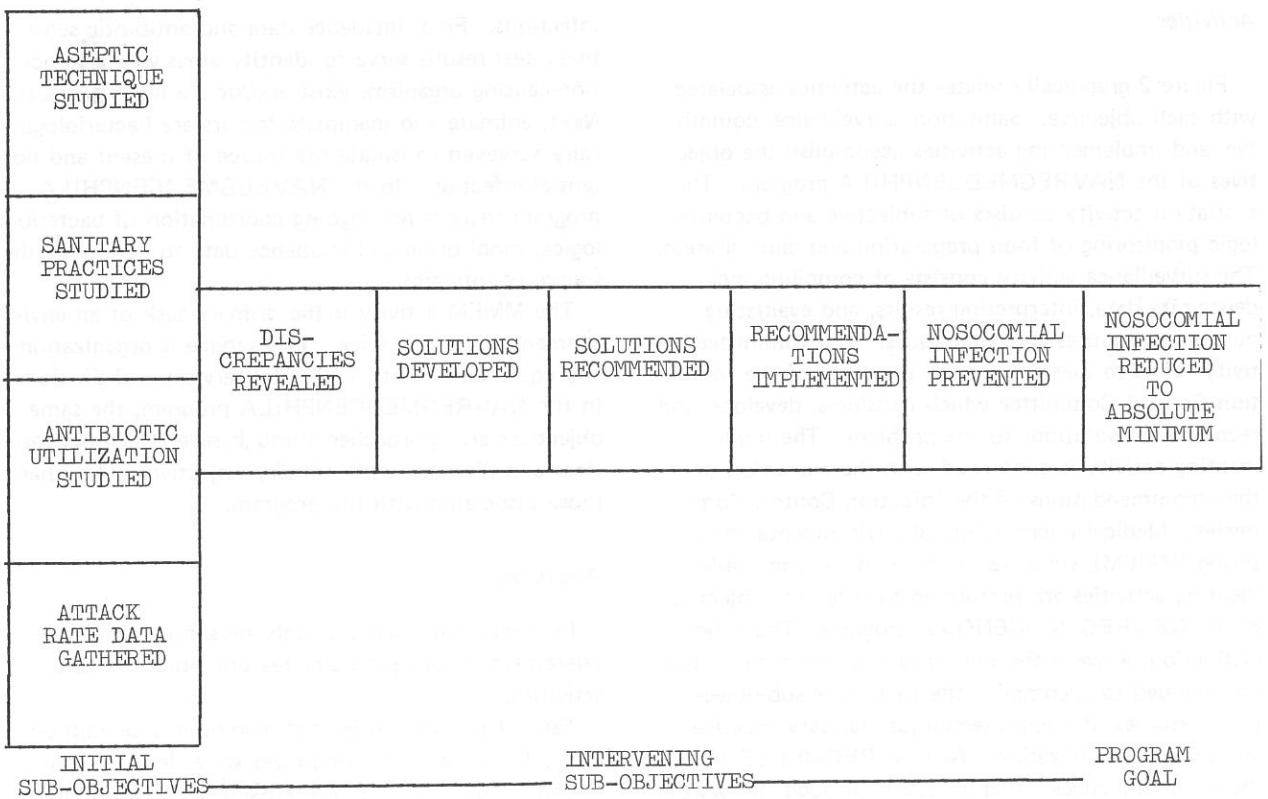


Figure 1.—Time Sequence of Program Objectives.

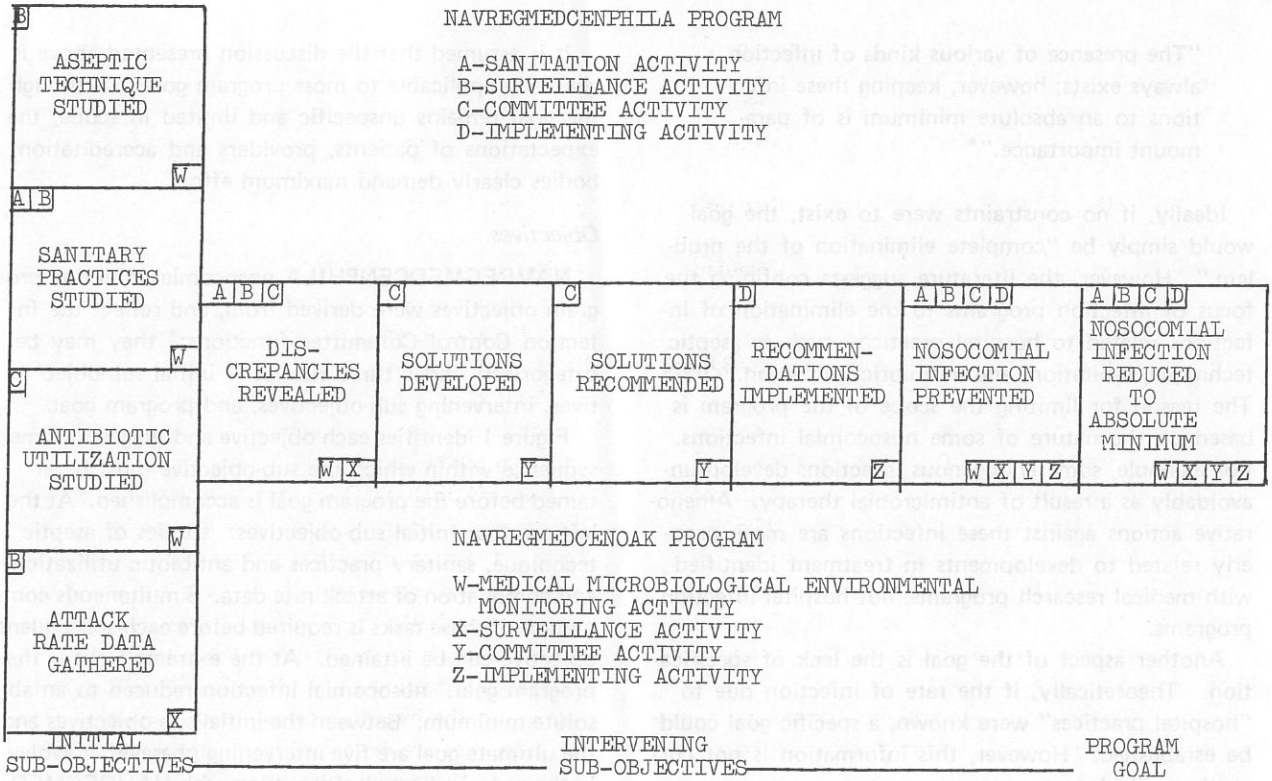


Figure 2.—Time Sequence of Program Objectives with Related Program Activities.

Activities.

Figure 2 graphically relates the activities associated with each objective. Sanitation, surveillance, committee, and implementing activities accomplish the objectives of the NAVREGMEDCENPHILA program. The sanitation activity consists of subjective and bacteriologic monitoring of food preparation and clinical areas. The surveillance activity consists of compiling incidence-rate data, interpreting results, and evaluating nursing procedures and techniques. The committee activity refers to meetings of the members of the Infection Control Committee which considers, develops, and recommends solutions to the problem. The implementing activity is concerned with the execution of the recommendations of the Infection Control Committee. Medical microbiological environmental monitoring (MMEM), surveillance, committee, and implementing activities are performed to meet the objectives of the NAVREGMEDCENOAK program. The major distinction between the two programs lies in the activities pursued to accomplish the first three sub-objectives: studies of aseptic technique, sanitary practices, and antibiotic utilization. At NAVREGMEDCENOAK, these sub-objectives are approached through the MMEM activity, an epidemiological approach to investigating infections. First, incidence data and antibiotic sensitivity test results serve to identify areas where infection-causing organisms exist and/or are likely to exist. Next, animate and inanimate factors are bacteriologically surveyed to isolate the source of present and potential infection. In the NAVREGMEDCENPHILA program there is no ongoing coordination of bacteriological monitoring and incidence data to determine the source of infection.

The MMEM activity is the primary task of an environmental health service. This service is organizationally equivalent to other hospital services and divisions. In the NAVREGMEDCENPHILA program, the same objectives are approached through several distinct services and divisions with primary objectives other than those associated with the program.

Resources.

In comparing resources, only personnel were considered since both programs feature labor-intensive activities.

Table 1 provides estimated man-hour expenditures for each program. Expenditures were derived from Hospital Instructions and discussion with personnel. Man-hours consumed by committee and implementing

activities are not included. Expenditures are significantly different in the two programs: approximately 124 hours per month were spent in the NAVREGMEDCENPHILA program, and 860 per month in the NAVREGMEDCENOAK program.

NAVREGMEDCENOAK personnel are either preventive medicine technicians, or have postgraduate training in public health specialties, except for the surveillance clerk. Personnel with similar qualifications are not involved in the NAVREGMEDCENPHILA program.

In summary, comparison of the programs reveals the following points:

(a) The objectives of the programs are similar.

(b) The NAVREGMEDCENOAK program provides a highly structured approach to the investigation of sources of infections. The NAVREGMEDCENPHILA program is less structured.

(c) The NAVREGMEDCENOAK program relies on a single hospital service to accomplish most of its objectives. The NAVREGMEDCENPHILA program relies on several organizational units.

(d) Preventive medicine technicians and personnel trained in epidemiology, or related areas, are not involved in the NAVREGMEDCENPHILA program, whereas, personnel with these qualifications do participate in the NAVREGMEDCENOAK program.

EFFICIENCY

A major concern is that an efficient relationship should exist between program expenditures and attainment of the program goal. A hypothetical representation of this relationship is presented in Figure 3. A small expenditure of resources has little impact on the problem (points on the curve below A); Increasing the expended resources has greater impact (points between A and B), and; Greatly increasing the resource expenditures results in only a little more gain (points above B). Point B on the curve is clearly the most desirable location, since maximum benefit is obtained without sacrificing scarce resources.[7]

NAVREGMEDCENOAK personnel indicate that efficiency was a major consideration in developing their model. If it is assumed that the model program operates at point B, evaluation of the data in Table 1 suggests that the NAVREGMEDCENPHILA program operates at a much lower point on the curve.

The exact location of the NAVREGMEDCENPHILA program on the hypothetical curve is unknown. However, resources are expended in much smaller quantities than in the model program, suggesting that the NAVREGMEDCENPHILA program is less efficient than desirable.

TABLE 1

ESTIMATED MONTHLY MAN-HOUR EXPENDITURES
NAVREGMEDCENPHILA AND NAVREGMEDCENOAK PROGRAMS

NAVREGMEDCENPHILA

PERSONNEL	HOURS/MO.
Operating Services Division Personnel	4
Surveillance Nurse	104
Laboratory Service Personnel	16
Total(excluding committee and implementing activity)	124

NAVREGMEDCENOAK

PERSONNEL	HOURS/MO.
Environmental Health Officer	172
Preventive Medicine Technicians	344
Surveillance Nurse	172
Surveillance Clerk	172
Total(excluding committee and implementing activity)	860

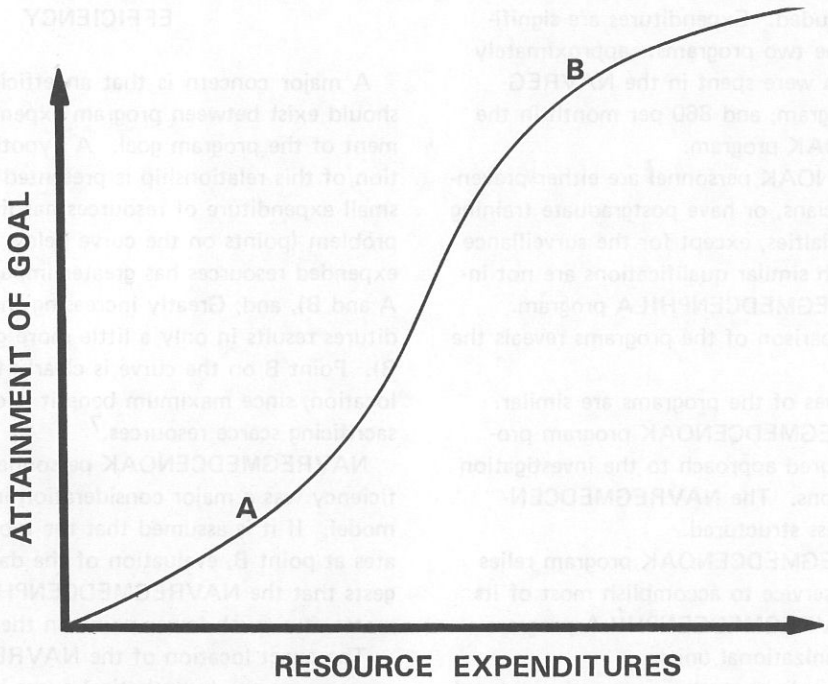


Figure 3.—Hypothetical projection of nosocomial infection-program efficiency at various levels of resource expenditure.

SUMMARY AND CONCLUSIONS

The effectiveness and efficiency of the nosocomial infection efforts at NAVREGMEDCENPHILA were evaluated through a comparison with a program model developed at Naval Regional Medical Center, Oakland. Similarity in the stated objectives indicates that the aims of the program are adequate. Differences in the type of activities and resources, and the quantity of personnel employed, indicate that the program is less effective than desired. The relatively small expenditure of personnel resources suggests that the program operates at significantly less than optimal efficiency at NAVREGMEDCENPHILA.

The evaluation indicates that the effectiveness and efficiency of the program can be improved through the application of ongoing epidemiologic investigation, establishment of a single organizational unit with primary responsibility for completion of program activities, and acquisition of additional professionally trained personnel.

Since completion of the evaluation, several steps have been taken to effect improvement. Through the assistance of NAVREGMEDCENOAK personnel, a program plan for an Environmental Health Service, with the primary mission of infection prevention and control has been developed. In addition, one Nurse Corps officer has been assigned on a full-time basis as the Infection Surveillance Nurse, and action has been initiated to acquire appropriate personnel to staff the Environmental Health Service.

It is considered that evaluation is useful in determining the capacity of an institution for addressing the nosocomial-infection problem. Perhaps this report will interest the program directors and personnel, at other naval regional medical centers, in evaluating nosocomial infection programs.

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Popular Podiatry Clinic at NAS, Glenview, Illinois

After 18 months in operation, the auxiliary Podiatry Clinic of NAS Glenview, along with the Podiatry Clinic at the Naval Hospital Great Lakes, has successfully treated just about every conceivable form of foot trouble. Confronted by a plethora of pedal problems from simple toenail disorders to complex orthopedic and dermatologic conditions, the Glenview Podiatry Clinic has given an excellent account of itself. The Clinic was recently lauded by CAPT Paul Merchant, Commanding Officer of NAS Glenview, who observed that the Foot Clinic had earned a highly respected position in the medical department along with dentistry, optometry, medicine, orthopedics, and surgery.

As the staff podiatrist on active duty at Naval Hospital Great Lakes became increasingly inundated with patients from the large recruit and dependent population in the area, LT Arnold Pock, MSC, USNR-R, Commanding Officer of Naval Reserve Medical Company 9-27 which meets at Loyola - Stritch School of Medicine in Maywood, Ill., volunteered to assist. With the approval and support of RADM W.C. Turville, MC, USN, Director of the Naval Regional Medical Center and CO, Naval Hospital Great Lakes, Dr. Pock proceeded to organize and equip the auxiliary Podiatry Clinic at NAS Glenview. After acquiring an antique podiatry chair that was about to be discarded, he succeeded in collecting miscellaneous instruments from various departments and opened the Glenview Foot Clinic to serve active duty and dependent patients.

Topical SPRAT anesthesia.

LT Arnold Pock, MSC, USNR-R (left) demonstrates shoe-wedging concepts to LCDR Wheeler and podiatry staff nurse LT Mary Wheeler (right).

Within two months, the Podiatry Clinic was set in full swing. Careful screening ensured that only legitimate consultations for surgical, orthopedic and dermatological treatment were referred to the naval hospital. Many

minor foot ailments were completely managed at Glenview. One of the most valuable services offered, for example, is the reduction of recurrent ingrown toenails by employing sodium hydroxide in specific concentration, for chemical destruction of marginal matrix cells. With this technique the need for radical procedures and suturing is obviated.

The Glenview Podiatry Clinic is maintained between the hours of 1200 and 1600 on specific Saturday afternoons when Dr. Pock voluntarily contributes his time and service under orders without pay. A staff podiatrist at the Zion-Benton Hospital and the Abbott Nursing Home of the Aged, LT Pock maintains a civilian practice in the nearby communities of Lake Forest and Deerfield, Ill. He is a member of the American and Illinois Podiatry Societies, and was recently appointed to the Board of Trustees of the American Academy of Podiatry Administration. He has completed previous tours of active duty at the naval hospitals at Camp Pendleton, Calif., and Orlando, Fla.; he has also provided two-day consultation services at the naval hospitals at Newport, R.I., and Key West, Fla. Keeping abreast of warfare tactices, LT Pock also completed a tour of duty at the Naval War College in Newport, R.I. While attending a Foot Surgical Seminar in April 1972, Dr. Pock offered consultative services to the Naval attache Singapore, and in Tokyo, Japan; he is especially interested in acupuncture, and the aging process of skin and toenails.

CAPT Paul Merchant (left), CO, NAS Glenview observes popular Foot Clinic in action.

Excision of plantar warts.

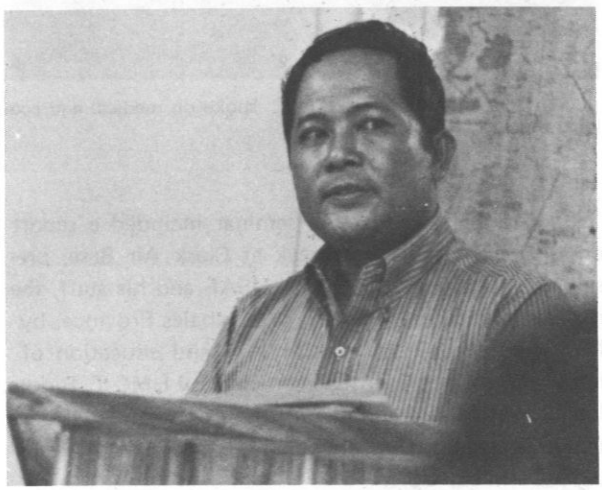
Dr. Pock thanks LCDR C. Vigdahl, NC, USNR, for assistance in scheduling appointments.

Assisting LT Pock at the Podiatry Clinic, NAS Glenview are: podiatry consultant LT Jay Schnitzer, MSC, USNR-R; and podiatry nurse LT Mary C. Wheeler, NC, USNR-R. The team is actively striving to promote "healthy feet" for the Navy. And what is their fondest dream for the successful, voluntary, Podiatry Clinic? You've guessed it—a new podiatry chair.

Preventive Medicine Seminar

The Preventive Medicine Service, U.S. Naval Hospital Subic Bay, Republic of the Philippines, held a two-day seminar on 3-4 May 1973 at the Regal Room, PWC Food Service. The theme of the meeting was "Preventive Medicine in the Philippines." Representatives from the Zambales Malaria Eradication Office, Public Works Entomology Office, Clark Air Base, Public Health, and the U.S. Naval Hospital shared their experiences during the seminar. The common goal was to become aware of current public health developments and to be able to improve programs at the respective commands.

CDR Baldauf, MSC, USN presented the opening remarks at Seminar.



Mr. Sembrano, Zambales Province Malaria Eradication Chief, spoke on the incidence of malaria adjacent to Subic Bay Naval Base.

CAPT Causey, VC, USAF addressed hoof and mouth disease in Zambales Province.

Mr. Banaag, entomologist, PWC, spoke on medical and ecologic pests in the Philippines.

Special highlights of the seminar included a report on the recent rabies outbreak at Clark Air Base, presented by Major R. Cole, MC, USAF and his staff; the malaria eradication program in Zambales Province, by Mr. Sembrano, District Supervisor; and education of lay personnel in preventive medicine, by HMC T. Riddle, USN. Particular emphasis on the professional development of preventive medicine staff was added by HMC J. McCormick, USN.

The final seminar session, lasting two hours, provided a problem-solving workshop where various public health representatives were called upon to answer questions, and to stimulate discussion on ways to improve military preventive medicine at Clark Air Base and Subic Naval Base.

CAPT Pariser, MC, USN (left), CO, U.S. Nav Hosp Subic Bay, is shown presenting seminar certificate to Major Cole, MC, USAF. LT Maas, MSC, USN (center) assisted CAPT Pariser.

CDR G.W. Baldauf, MSC, USN, Administrative Officer at U.S. Naval Hospital Subic Bay, R.P., officially opened the seminar at 0730 on 2 May 1973.

CAPT H.P. Pariser, Commanding Officer, U.S. Naval Hospital Subic Bay gave the closing remarks at the end of the seminar, and presented certificates to the attendees. The Subic Bay Area Medical Officer stressed the value of sharing each other's public health experiences, and expressed the hope that further medical liaison between Filipine nationals and military medical personnel could be established through other services at the Naval Hospital.—PAO, US Nav Hosp Subic Bay, R.P.

198TH NAVY BIRTHDAY

CNO has urged all Navy commands and units to begin planning local ceremonies to mark the Navy's 198th birthday on 13 Oct 1973. The theme for this year's celebration is "Navy Birthday — A Family Tradition." "Navy Birthday" marks the day in 1775 that the Continental Congress authorized the outfitting of the first ships for the Continental Navy — an Act which represents the genesis of the U.S. Navy. Last year was the first time the occasion was officially celebrated on a Navy-Wide basis.

In NAVOP 94-73, CNO defined the Navy family as active duty personnel, dependents, Navy civilians, Reservists and retirees, all of whom have played a role in shaping the character of the Navy.

CNO also noted that CHINFO will distribute "Navy Birthday" information kits, based on the selected theme, to all commands in the near future to assist them in their planning.—CHINFO Weekly Newsgram, (22-73).

THE HEMATOLOGISTS' CORNER

Thalassemia Syndromes — Selected Aspects

By LCDR Michael A. Habib, MC, USN,
and
CAPT Richard A. Burningham, MC, USN,
Hematology Branch, Internal Medicine and
Clinical Investigation Services, Naval Hospital,
Philadelphia, Pennsylvania 19145.

In Greece, Cyprus, Italy, Burma, Thailand, and other noncontiguous areas, a hypochromic, microcytic anemia of variable severity affects up to 30% of the native population. This anemia, which is not the result of iron deficiency, has been given the fanciful name of "thalassemia" meaning "the sea."[1] An understanding of this disorder is necessary to an appreciation of the mechanisms of synthesis of the protein (or globin) portion of hemoglobin.

Thalassemia more aptly refers to a group of disorders having similar pathophysiologic mechanisms, hence, the term thalassemia *syndromes* applies. These disorders have different severities depending upon whether or not there is homozygous or heterozygous inheritance.

The normal hemoglobin chains of man are designated by Greek letters, each hemoglobin molecule being composed of four globin chains. Hemoglobin A, which comprises more than 95% of the hemoglobin in normal erythrocytes, is written graphically as $\alpha_2{}^A\beta_2{}^A$, indicating that there are two alpha and two beta chains of normal structure. In similar fashion the minor fraction of normal adult hemoglobin, hemoglobin A_2, is designated $\alpha_2{}^A\delta_2{}^{A2}$; and hemoglobin F, fetal hemoglobin, is designated $\alpha_2{}^A\gamma_2{}^F$. The normal state prevails when equal amounts of α and β chains are synthesized.

In contrast, the person who presents one of the thalassemia syndromes has inherited one or more abnormal genes controlling globin synthesis. This results in *decreased* synthesis of one or more of the above-noted *normal* globin chains. Thus, alpha thalassemia refers to the fact that decreased amounts of α chain are made in the red cell, beta thalassemia refers to decreased amounts of β chain, etc. Combinations, such as $\alpha\beta$, and $\delta\beta$ thalassemia, refer to the fact that there is decreased synthesis of both the indicated chains.

GENETICS

Since one gene controls the synthesis of one polypeptide chain, and since globin consists of four

The opinions or assertions expressed herein are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

polypeptide chains, then at least four genes are important in controlling globin synthesis. Heterozygous thalassemia, then, is usually the result of having one normal and one abnormal gene controlling synthesis of a particular globin chain. Heterozygous beta thalassemia can then be expressed as $\alpha_2{}^{A}\beta^{A}\beta^{THAL}$. Similarly, homozygous thalassemias are obtained when both genes controlling a given chain are deficient (or absent). Thus, homozygous beta thalassemia can be written as $\alpha_2{}^{A}\beta^{THAL}\beta^{THAL}$. Although simplified, this schema allows a clear understanding of the genetic mechanism involved in production of a given clinical state.

It is necessary to realize the importance of genetic studies in thalassemia. As in sickle cell disease, genetic counseling is meaningful only if the physician determines the severity of disease in patient, siblings, parents, and appropriate blood relatives. In fact, it is necessary, at times to study all members of a family before one can establish the type of thalassemia in a given patient.

MOLECULAR PATHOLOGY

The intracellular synthesis of globin, and proteins in general, can be schematized as presented in Figure 1.

The diagram indicates that a given nuclear material (DNA, or genes) controls the synthesis of a base-complementary RNA. This RNA carries the message of the DNA (hence, it is labeled "messenger RNA," or mRNA) to the cytoplasmic ribosomal units. The mRNA-ribosomal complex, known as a polyribosome, is the assembly line where mRNA is translated and amino acids are assembled into the appropriate globin chains. In the more familiar hemoglobinopathies, e.g., hemoglobins S, C, D, etc., the defect is localized at site (1), an alteration in DNA structure producing an alteration in the amino acid structure of site (7), the globin chain.

In thalassemia, however, the defect is more complex; one or more *normal* globin chains are produced in reduced quantities, or not at all. Every site in the schema is suspect, but recent experimental work has eliminated some of these possibilities. Site (7), the end product, has normal structure, therefore, it is unlikely that there is a defective part of sites (1), (2), or (3) involving areas which directly *control amino-acid sequences.* In a system using ribosomes from thalassemia patients and mRNA from rabbits, it has been shown that normal rabbit globin chains are produced in normal quantities. Site (4), the ribosome, therefore appears normal. Other studies have demonstrated that

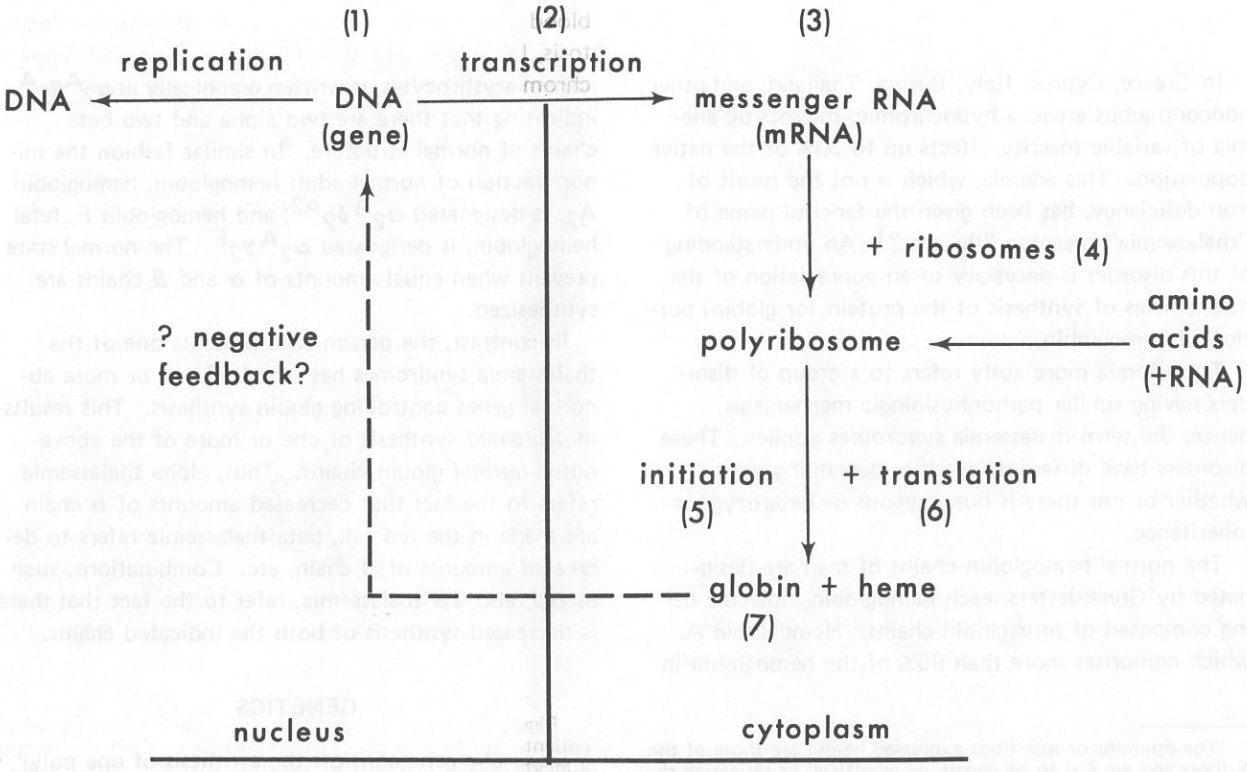


Figure 1.—Schematic representation of the intracellular synthesis of globin.

the initiation of synthesis at site (5) is normal, while the translation site (6) of thalassemia mRNA also appears to be normal.

It would seem that the defect is at site (1), or (2), or both, or in a system indirectly related to these. At site (3) the defect would be such that a structural alteration of the mRNA molecule would lead to defective attachment to the ribosome, or to an acceleration in its metabolic breakdown. Both of these possibilities would lead to diminished synthesis of a normal globin chain. An abnormality in DNA [site (1)] could lead to thalassemia via several different ways: 1) transcription [site (2)] of a mRNA with the abnormalities previously described; 2) reduced rate of transcription, leading to a reduction in the quantity of an otherwise normal mRNA.

A final possibility is that there is a nuclear, or cytoplasmic system responsible for the normal metabolism of site (1), or site (3), which is functioning abnormally. As before, this would lead to a reduction in the quantity of normal mRNA, and, hence to a decreased amount of normal globin chains.

Many groups are actively engaged in studying the problem of globin synthesis in thalassemia, both in peripheral blood and bone marrow. Technical difficulties abound, and progress is slow. The eventual outcome of these investigations, at this time, is purely speculative.

PATHOPHYSIOLOGY

This disparity in synthesis of one of a pair of globin chains has a number of important effects on the red cell:

1) The impairment of globin chain synthesis leads to reduced formation of the pigmented red cell protein, hemoglobin, and characteristic hypochromia and microcytosis follow.

2) Deficient synthesis of one chain leads to a relative excess of one or more of the other globin chains. In α thalassemia, for example, an excess of alpha chains is present. Alpha chains, when not combined with beta chains, are unstable. Consequently they interact with, and precipitate on erythrocyte membranes. This phenomenon is most strikingly seen in the bone marrow, stained with dyes such as brilliant cresyl blue. Basophilic inclusions are seen in mature, nucleated erythroid precursors. Hemoglobin synthesis is ineffective, and results in intramedullary hemolysis of varying severity. Those cells that reach the peripheral blood have reduced membrane deformability because of the membrane-attached, free globin chains. Reticuloendothelial or splenic trapping results in striking alterations of erythrocyte size and shape, and reduced erythrocyte life span.

3) Reduction in synthesis in one chain leads to a compensatory increase in synthesis of one or more of the other chains normally produced by red cells. In beta thalassemia, compensatory increases in γ- and δ-chain synthesis result in increased quantities of hemoglobin F ($\alpha_2\gamma_2$), and hemoglobin A_2 ($\alpha_2\delta_2$), respectively. In alpha thalassemia, on the other hand, compensatory increases in β- and γ-chain synthesis result in increased quantities of hemoglobin H (β^4 tetramer) and/or hemoglobin Barts (γ^4 tetramer), the latter primarily in newborns. The use of appropriate cytochemical stains would then demonstrate membrane-bound α chains in beta thalassemia (*Fessas' bodies*),[2] or precipitable free β chains in alpha thalassemia.

CLINICAL FEATURES

In the typical patient with homozygous beta thalassemia there is a severe anemia, which is predominantly hypochromic and microcytic. Reticulocyte elevation is moderate. Pallor and splenomegaly are common, as is the typical *Cooley's* facies. In patients who have received multiple blood transfusions, cutaneous changes indicative of transfusion hemosiderosis may be seen. Leukopenia and thrombocytopenia secondary to hypersplenic destruction, may be found. The peripheral blood smear (Figure 2) shows marked anisopoikilocytosis, basophilic stippling, nucleated red cells, hypochromia and microcytosis, while the bone marrow

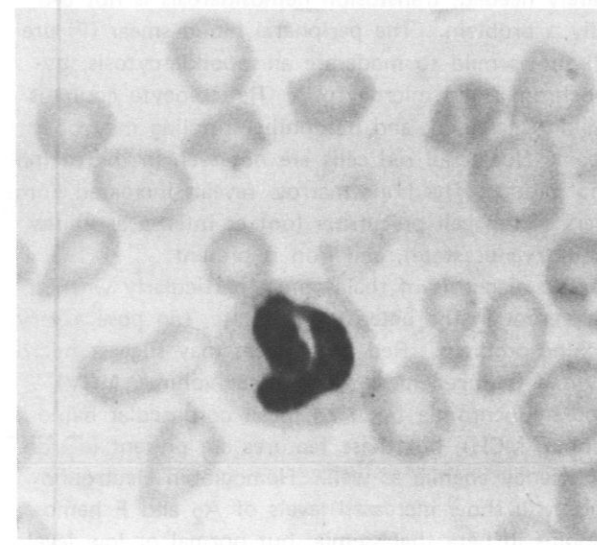


Figure 2.—Representative field from the blood smear of a patient with homozygous beta thalassemia. Striking anisopoikilocytosis and mild hypochromia are seen. (Wrights-Giemsa, X1000)

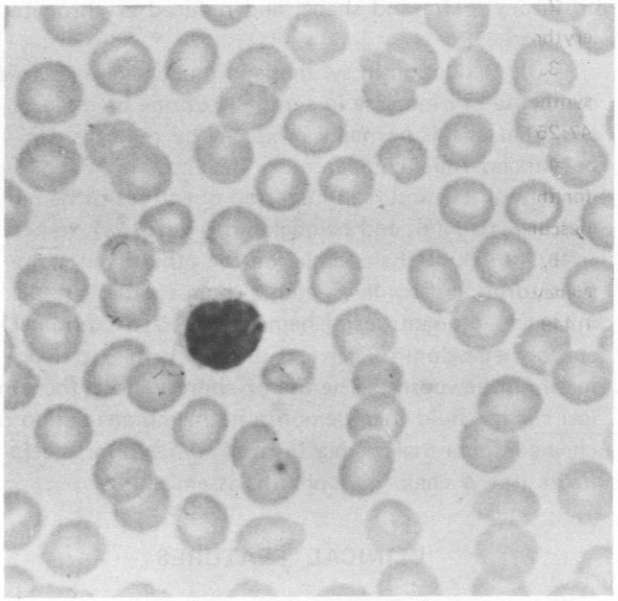


Figure 3.—Representative field from the blood smear of a patient with mild, heterozygous beta thalassemia. Anisocytosis is most prominent, and hypochromia and target cells are seen. (Wrights-Giemsa, X450)

study will reveal intense hyperproliferation of red-cell precursors, and normal or increased iron stores. Homozygous alpha thalassemia, on the other hand, presents as hydrops fetalis at birth, and is incompatible with life.

Heterozygous beta thalassemia, and alpha thalassemia as well, may show mild to moderate anemia and mild splenomegaly, if any. Since transfusions are rarely needed, transfusion hemosiderosis is not usually a problem. The peripheral blood smear (Figure 3) shows mild to moderate anisopoikilocytosis, hypochromia and microcytosis. Reticulocyte count is mildly increased, and basophilic stippling may be seen. Nucleated red cells are not seen in the peripheral blood. The bone marrow reveals increased numbers of red cell precursors (not as intense as in the homozygous state), and iron is present.

The diagnosis of thalassemia, particularly when it is present in the heterozygous state, can pose a very vexing problem. Red cell indices may suggest microcytosis (reduced mean corpuscular volume, MCV), and hypochromia (reduced mean corpuscular hemoglobin, MCH), but these features are present in iron deficiency anemia as well. Hemoglobin electrophoresis will show increased levels of A_2 and F hemoglobins in beta thalassemia, but normal or low levels in alpha thalassemia. Hemoglobin H and Barts hemoglobin may not be seen with conventional electrophoretic techniques. Concomitant iron deficiency will cause reduced levels of A_2 hemoglobin, thus obscuring the diagnosis.

Until recently, sophisticated laboratory procedures were needed in a number of cases to prove that, indeed, thalassemia was present. These procedures[3] involved the incubation of peripheral blood, or bone marrow, with a radioactive amino acid; lysis of incubated red cells containing labeled hemoglobin; dissociation of heme from globin; and separation of beta from alpha chains by column chromatography. The radioactivity of individual labeled chains was determined, and a ratio of beta/alpha chain synthesis was calculated. Values less than one are seen with beta thalassemia, while values greater than one are present in alpha thalassemia. This technique is exact, but laborious and time consuming.

Lacking a simple screening procedure analogous to the sickling phenomenon (hemoglobins), or to abnormal migration of hemoglobins in starch or agar gels at different pH values, workers turned to other methods. Recently two simple screening procedures have been recommended. In one[3] it is suggested that an MCV greater than 79 μ^4, as determined by the Model S Coulter electronic counter, in the presence of elevated hemoglobin A_2 levels and a normal serum iron, is diagnostic of beta thalassemia; while an MCV less than 79 μ^3, in the presence of a normal or low hemoglobin A_2 level, is diagnostic of alpha thalassemia.

The second procedure[5] recommends a discriminant function (DF), derived from analysis of Coulter S counter data in patients with thalassemia, or iron deficiency. This function is defined as:

DF = MCV — Rbc count — (5 X hemoglobin as g%) -3.4;

Values greater than +1 = iron deficiency;

Values less than -1 = thalassemia.

As experience with these simple screening methods accumulates, their reliability, specificity and sensitivity will be determined.

THERAPY

Unfortunately there is no good way to treat the severe anemia of homozygous beta thalassemia. Multiple transfusions are unavoidable in the typical patient, and these lead to iron overload and organ dysfunction resulting from hemosiderosis. The homozygous patient has a shortened life expectancy because of the chronic, severe anemia, as well as the hemosiderosis. The only hope for these severely effected patients lies in the alteration in rates of chain synthesis toward normal, a feat that will require significant genetic engineering. This, unfortunately, does not appear to be possible in the near future.

ACKNOWLEDGMENT

We wish to express our appreciation to the Photography Department for the photographs which accompany this paper.

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ANNUAL NAVY DENTAL RESEARCH BREAKFAST.—RADM J.P. Arthur, DC, USN (left), Chief of the Dental Division and Assistant Chief for Dentistry, BUMED, describes some of the future plans for the Navy Dental Corps to RADM C.O. Holmquist, USN (center), Chief of Naval Research and Assistant Oceanographer for the Navy, as RADM E.C. Raffetto, DC, USN (Ret.) (right), former Chief of the Navy Dental Corps, adds his enthusiasm. The breakfast was held in conjunction with the Annual Meeting of the International Association for Dental Research in Washington, D.C., in Mar 1973. RADM Holmquist and RADM Arthur were principal speakers for the breakfast meeting.

The Current Status of Anabolic Steroids in the Treatment of Diabetic Retinopathy

By LT David W. Brigham, MC, USNR,*
Destroyer Squadron 23, Naval Station,
San Diego, California.

INTRODUCTION

The incidence of diabetic retinopathy (DR) has been steadily increasing since the introduction of insulin (Dardenne).[1] Caird[2] demonstrated that the frequency was related to age, duration of diabetes, and carbohydrate control. Caird[2] also contends that nearly 75% of diabetics will present signs of retinopathy after 15 years of the disease; Secondly, as age advances, retinopathy is found more frequently at the point of initial diagnosis; Thirdly, strict control of carbohydrate metabolism is generally thought to be associated with a lower incidence of retinal vessel disease. The U.S. Public Health Service reports that diabetes is a leading known cause of poor vision. Of 5,571 new registrations listed with the U.S. Department of Health, Education and Welfare (1967),[3] 544 or 9.8% had diabetes; this was superseded only by cataract (18%), macular degeneration (14%), and glaucoma (12%). Among these 544 patients with DR, a moderate female predominance (in a ratio of about 3:2) was noted. Secondly, no racial dominance appeared. Finally, most of these patients developed poor vision associated with DR, in the fourth and fifth decades, with the greatest number having a corrected visual acuity no better than 20/200.

DR may be characterized as a disease of the capillaries supplying the retina. In a recent review of the pathophysiology of DR, Addison[9] observed with electron microscopy that intramural pericytes, within the basement membrane of retinal capillaries, undergo degeneration. Addison considered these cells are unique to the retina, commonly involving those layers supplied by the central retinal artery (Dobree)[10] and, less commonly, the choroid (Fisher,[20] Beetham,[19] and Dobree). Clinically the disease may progress in stages, but is characterized by spontaneous remissions, relapses, or complete arrest. Visual disturbance depends largely on the degree of involvement of the macular area. Specifically, one may first see microaneurysms of capillaries that tend to persist for weeks and months. Later surrounding yellow, waxy, and hyaline exudates rich in lipids and mucopolysaccharides may appear, generally in the external plexiform layer of the retina (Scheie).[11] Hyalinization of the microaneurysms is believed to result in discrete, punctate, white dots. Hemorrhagic lesions may appear: as punctate dots; superficial and flame-shaped; round and deep; and preretinal (subhyaloid). The latter category of hemorrhage is generally associated with the development of organized fibrous bands extending into the vitreous and prediposing to retinal detachment. Ultimately, compromised circulation stimulates neovascularization either on the surface, within, or beneath the retina. The former may extend into the vitreous, leading to the formation of fibrous tissue membrane—retinitis proliferans.[11]

*Dr. Brigham is presently on the staff at the Branch Dispensary, Naval Station, San Diego, Calif.

The opinions expressed herein are those of the author and cannot be construed as reflecting the views of the Navy Department or the naval service at large.

The prognosis for vision in this disease is unpredictable. Most patients do not progress beyond the stage of hemorrhages and exudates (Becker, Scott);[6,7] about 25% will progress to legal blindness. Concerning the prognosis of these severely affected individuals, Patz and Burkow[8] state that it takes on the average of 17.5 years for bilateral blindness to develop when diabetes is diagnosed in a person under 20 years of age; furthermore, once blind, there is an interval of another 5.8 years until death.

TREATMENT RESULTS

Many aspects of the pancreas and endocrine system have been studied since it has become evident that insulin is not the total answer in the therapy and management of diabetes mellitus. Saskin,[12] realizing that controlled diet and insulin often prove inadequate in the long-term management of diabetics, sought to control the associated vascular disease with anabolic steroids. This study was based on the existence of liver dysfunction and a negative nitrogen balance found in diabetics with vascular disease. Noting that such damaged livers were unable to inactivate estrogen but seldom lost their ability to destroy androgens, he reasoned that a relative androgen deficit must exist. Secondly, he noted an improvement in patients with hepatitis who were treated with testosterone propionate; he concluded that testosterone might reverse nitrogen imbalance, and possibly antagonize the relative estrogen excess which appears in diabetics with vascular disease. This marked the birth of a new approach in controlling the vascular disease of diabetes mellitus.

Since this work was published in 1951, only a limited number of reports on this topic have reached the literature, and for the most part the data are difficult to compare. Many anabolic steroids have come into use (see Table I). Based upon availability and observed side effects (see Table II), differences among the agents used in treatment were observed. Other problems noted were the variable degrees of disease treated, lack of controls in some studies, and variations in treatment time.

Recently, however, significant reproducible results are being obtained through the use of the double-blind method in large groups, and employment of ocular fundic photography, respectively.

Although the intent of this paper was to summarize all the available data on the use of anabolic steroid treatment in DR, only a few significant comparisons can be made. Table III lists the investigative work of ten authors extending over the years of 1951 to 1967. Included here are 297.5 patients treated with anabolic steroids, and 70.5 control subjects. Insufficient data on seven treated subjects and six control subjects precluded their use in this study. This left 290.5 treated, and 64.5 control subjects, a total of 355 patients studied. The fractions resulted from one study wherein eyes were considered unilaterally, instead of bilaterally per patient. Table III shows the number of patients in each study, the dosage and anabolic steroid used, the duration of treatment (time), the degree of disease treated, and the results of each study. The results are presented in four columns: those patients showing fundic improvement (+); no change ($\pm$); deterioration of fundic appearance (–); the fourth column is the combined total of + (fundic improvement) and $\pm$ (no change), representing the number of patients in whom no new hemorrhage occurred (no new hem.).

Five investigators administered Durabolin as the anabolic agent. When the treated and the control groups were compared, those without new hemorrhage vs. deterioration in fundic appearance, chi square analysis gave $x^2=5.76$; n=4, P=0.25. Such analysis suggests that this specific agent does not influence the fundus. Secondly, after comparing the entire treated group with the control group, chi square analysis gave $x^2=1.03$; n=4, P=0.85. This strongly suggests that anabolic agents in general do not influence the fundic appearance in DR.

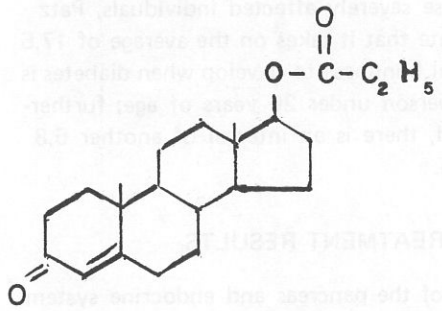
The "no new hemorrhage" group was used in a comparison with the fundic deterioration group because, in addition to improvement in retinal appearance, the absence of further retinal bleeding could also be construed to represent additional beneficial effect. However, the natural history of this disease cannot be overemphassized, and remissions, relapses, and arrests may occur in untreated patients. Perhaps the question as to what constitutes a beneficial effect remains moot. However, for the purpose of this paper, beneficial effect represents not only visible improvement but also prevention of deterioration.

Two studies[14,15] addressed the importance of diet in managing this disease. Both employed high protein (120-140 gm.), and low fat (40-60 gm.) diets. Both reported encouraging results. Also, three workers[1,4,12] reported increased insulin sensitivity, lowered insulin requirements and improved glucose tolerence in those patients who were treated with anabolic steroids.

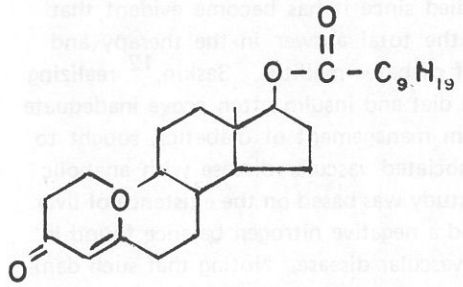
From another point of view, three authors conducted metabolic studies correlating anabolic steroid treatment with biochemical changes (see Table IV). In long-standing diabetes mellitus, abnormal findings other than the blood sugar develop. Within the protein spectrum, the level of albumin is decreased and the alpha-2 globulin is increased. Changes in this spectrum have been observed following anabolic steroid treatment. The

TABLE I

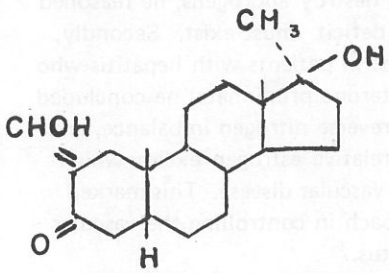
SOME ANABOLIC STEROIDS CURRENTLY IN USE



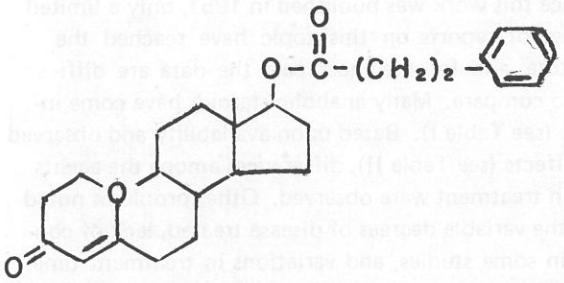
TESTOSTERONE PROPIONATE



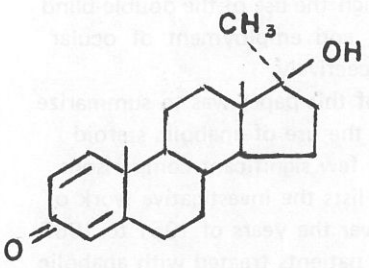
DECA-DURABOLIN
(NANDROLONE DECANOATE,
NORANDROSTENOLONE DECANOATE)



7-OXYMETHOLONE



DURABOLIN
(NANDROLONE PHENPROPIONATE,
NORANDROSTENOLONE PHENPROPIONATE)



DIANABOL
(METHANDROSTENOLONE,
METHANDIENONE)

TABLE II

SIDE EFFECTS IN REPORTED SERIES

SASKIN[12]	1951	28 pts.	None reported; mentions the possibility of masculinization with doses > 300 mg.
BEDROSSIAN[13]	1963	63 pts.	No serious effects; some psychic complains, but treated equal no. of complaints in controls.
GURLING[5]	1955	37 pts.	No side effects.
DARDENNE[1]	1961	48 pts.	No detrimental side effects.
HOUTSMULLER[4]	1961	33 pts.	None reported.
HOUTSMULLER and VAN POPPEL[14]	1963	55 pts.	None reported.
FABRYKANT[15]	1964	46 pts.	Two pts. with nephropathy and congestive heart failure developed edema.
HUNTER[16]	1967	31 pts.	See table below.
TOTAL PTS.		341 pts.	17 pts. with side effects, or 5%.

	Died	CHF*	↑BP	Edema	Voice	↑Libido
15 treated	1	3	2	3	1	1
16 control	1	1	1	1	0	0

(Two treated pts. developed headache and unsteadiness.)

*CHF=Congestive Heart Failure

data reflect findings in 229 patients, comparing changes in their protein spectrum before, and after treatment. The categories considered involve 195 treated and 34 control subjects. The results are presented in three columns identifying those spectra approaching normal (+), those showing no change (0), and those representing deterioration (-). A chi-square analysis of these data shows $x^2=71$, n=6, and P=0.001. The data suggest that there may be a beneficial effect on protein metabolism with the use of anabolic steroids. Evidence such as that summarized in Table IV prompted others to further explore the mechanism of action of the anabolic steroids.

Tainter[17] reported on anabolic steroids in the management of diabetic patients. His main interest was the etiology of the depletion of protein stores in the insulin-dependent diabetic patient. He focused his attention on untreated diabetes mellitus accompanied by weight loss and depletion of tissue protein, with an increase in the rate of nitrogen excretion. Insulin was shown to have direct action on tissues, leading to increased amino-acid uptake with incorporation into newly formed protein (see Figure 1). Tainter further notes that in the experimental insulin-deficient animal, nitrogen loss is enhanced by secretion of corticosteroids; furthermore, he theorizes that anabolic steroids inhibit the action of the corticosteroids at the cellular membrane, blocking the catabolic action of the corticosteroids.

In summary, he suggests that the factors which control the interchange of protein at the cellular level are: energy requirements, metabolic-turnover rate of amino acids, extracellular amino-acid availability, and membrane permeability with its hormone-dependent mechanisms of transfer. Tainter proposes a tentative hypothesis

TABLE III

FUNDIC CHANGES IN PATIENTS TREATED WITH ANABOLIC STEROIDS

Author	No. cases	Drugs	Dose	Time	Degree of disease treated	Results			
						+	±	-	No. new hem. (+ and ±)
Dardenne[1] 1961	48	Durabolin	50mg every 3 weeks, IM	1.5 yr	Type of hem. not specified. No description of the stages of DR treated; impression favorable.	8	34	6	42
Houtsmuller[4] 1961	33 (66 eyes)	Durabolin or Deca-Durabolin	25mg wkly 50mg tri-wkly.	12 mos	Type of hem. not specified. Good correlation betw. biochem. & fundic improvement.	?	? (7 not specified)	6	20
	6 (12 eyes)	Placebo				?	?	?	?
Weissel[23] 1962	1	Durabolin	25-75mg daily IM	1 mos	?	1	0	0	1
Houtsmuller and Van Poppel[14] 1963	46	Durabolin or Deca-Durabolin	25mg wkly 50mg tri-wkly.	12 to 24 mos	All types of hems. All classes of DR. No sig. benefit noted; now working on early stages.	5	28	13	33
	9	Placebo				0	4	5	4
Fabrykant[15] 1964	46	7-Oxymetholone or Dianabal or testosterone	0.5-7.5mg oral, daily. 25mg wkly.	6 mos to 5.5 yr	Various stages of DR, I-V.	?	?	20	26

Hunter[16] 1967	15.5 (33 eyes) 22.5 (45 eyes)	Dianabal Placebo	5mg oral, bid.	20 to 24 mos	All types of DR except ret. prolif. All pts. had clear media. No vit. hems.	0.5 2.5	11 17.5	5 2.5	11.5 20
Saskin[12] 1951	28	Testosterone propionate	50mg/25mg alt. wks, IM	4 mos	Round, discrete, ret. hems. Hard exudates (exuds). No change in exuds.	21	7	0	28
Bedrossian[13] 1953	20 20 23	Testosterone propionate (Test. pro.) Test. pro. plus estradiol benzoate. Saline	50mg wkly IM	5 mos	I= hem. or exud. II= hem. and exud. No preret. hem. No prolif. retinitis. No statistical improvement.	1 6 1	5 1 8	14 13 14	6 7 9
Gurling[5] 1955	17 10 10	Methylandrostenediol (MAS) MAS plus antihyperten. Antihyperten.	60-200mg oral, daily	4 mos	All classes of DR were treated. No statistical improvement.	13 2 1	1 6 8	3 2 1	14 8 9
Valk[22] 1959	12	Durabolin	25mg daily, IM	1 to 12 mos	I= microaneurysms,<5. II= small hems.,<15. III= small hems., & small exuds. No preret., or vit. hems. No ret. prolif.	12	0	0	12

TABLE IV

PROTEIN SPECTRUM IN DR PATIENTS TREATED WITH ANABOLIC STEROIDS

AUTHOR	NO. CASES	DRUGS	TIME	RESULTS +	RESULTS 0	RESULTS -
Houtsmuller[4] 1961	87	Durabolin 25mg wkly. Deca-Durabolin 50mg triwkly, oral. Placebo	6 mos	46 11 2	0 0 2	15 2 9
Dardenne[1] 1961	14	Deca-Durabolin 50mg triwkly, IM	3 mos	14	0	0
Houtsmuller and Van Poppel[14] 1963	128	Durabolin 25mg wkly. or Deca-Durabolin 50mg triwkly, IM. Placebo	12 mos	73 0	18 0	16 21

TOTAL-229	+	0	-
TREATED	144	18	33
PLACEBO	2	2	30

$x^2 = 71$
$P = 0.001$

that the protein-sparing action of the anabolic steroids is primarily exerted at the cell membrane, but may also result from either stimulation of amino-acid incorporation into body protein, and/or inhibition of amino-acid breakdown.

In another study, O'Malley[18] reviewed the biochemical mechanism of action of androgens and estrogens as part of a study to determine the primary site of hormone action. He suggested that androgen administration results in increased ribonucleic acid (RNA) polymerase and RNA synthesis. He further suggested that androgens only stimulate RNA polymerase activity in target-tissue nuclei, and that the bulk of the newly synthesized RNA appears to have a base composition like that of ribosomal RNA. After accumulation of messenger RNA and androgen-induced ribosomal RNA, protein synthesis and active respiratory mechanisms resume at a normal level. He also observed that cell proliferation is reflected in a larger increase of deoxyribonucleic acid (DNA) polymerase activity in prostate tissue treated with testosterone. O'Malley concludes that the action of androgens is most important in cell replication. Moreover he suggests that estrogens are required for new enzyme function and cell hypertrophy. However, he considers that both androgens and estrogens are needed to effect a coordinated target-tissue response involving RNA and DNA synthesis. Both are necessary for cell growth and replication. Although these observations were made using the chick-oviduct system as a model, one might reasonably assume that other cellular systems may be similarly, or partially, so affected. How these observations may apply to the retinal vascular disease of diabetes mellitus has not been explored, but future studies will elucidate this further. If intramural pericytes are seen to be degenerating, as Addison[9] suggests, the question of the relationship of anabolic steroids to estrogens must be raised. Further investigation to define this relationship, or that involving other hormone systems, is needed.

DISCUSSION

Primarily this paper has focused on the current status of anabolic steroids in the treatment of diabetic retinopathy, including a hypothetical description of the mechanism of action of these agents. The data from ten

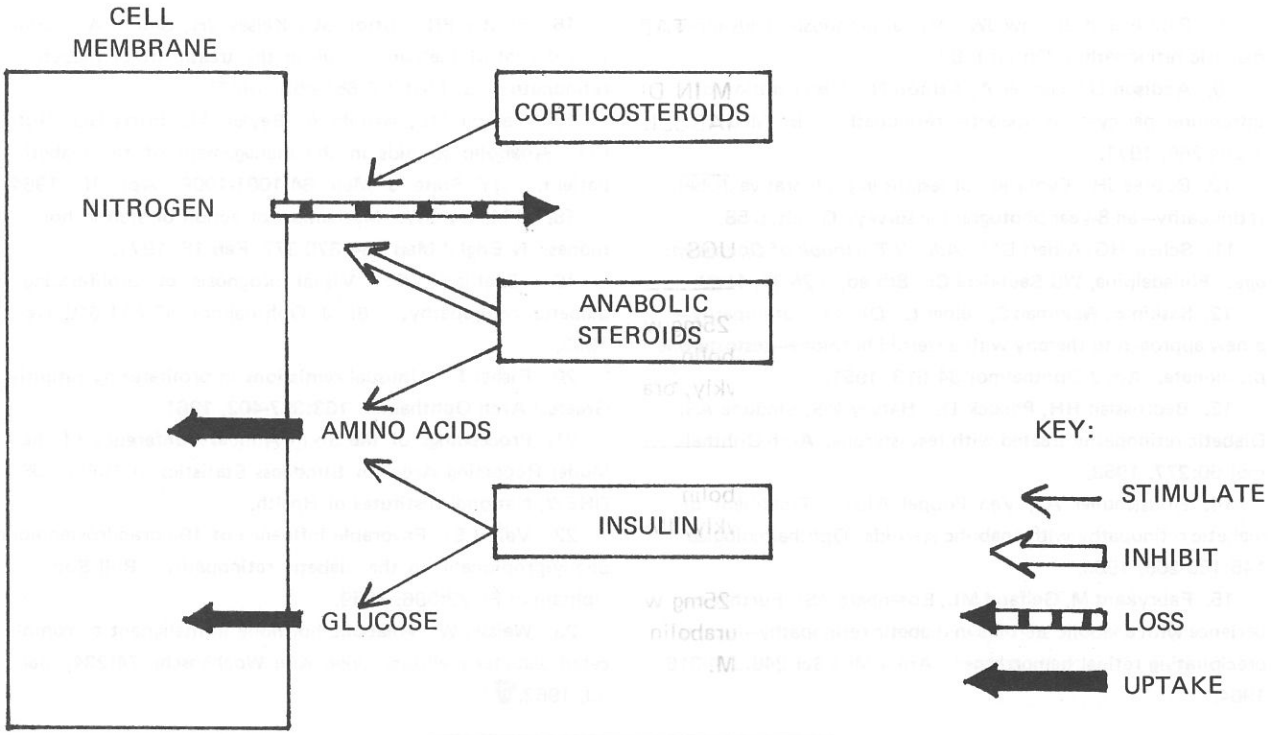


FIGURE I.—Interaction of Insulin and Steroids on Cell Membrane.

studies were compiled. The results suggest that although anabolic steroids do not effect a significant visible change in the fundi of patients with diabetic retinopathy, there does seem to be some beneficial biochemical advantage in their use. It was not established how improvement of the protein spectrum affects the vascular status of the retina.

Presently, anabolic steroids are not being used extensively in the management of diabetic patients. Nevertheless, further clinical evaluation should continue in assessing these drugs, emphasizing the use of the double-blind technique on a long-term basis. Secondly, any diabetic patients being treated with these agents should be followed by frequent funduscopy in order to detect the presence or absence of new fundic hemorrhages; more promising results can be expected, however, through biochemical investigation with special attention to the protein spectrum. More laboratory studies are needed to determine any existing relationship between hormone systems and the integrity of the vascular system, especially the retinal vascular system.

At the present time anabolic drugs, like insulin, do not seem to provide the total answer to the treatment of diabetic retinopathy. Although anabolic agents seem to play a significant role at the cellular level, this has not been satisfactorily observed at the organ level, that is, the retinal vasculature. Therefore, if anabolic steroids are considered for use in the management of diabetic retinopathy, they must be used with caution, patience, and the realization that insulin sensitivity may be markedly increased; any immediate, visible fundic change may be consequential, and may not be directly related to the anabolic agent per se.

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OPERATION HOMECOMING.—A 50-foot "Welcome Back" letter was delivered on 5 Mar 1973 to former Navy POW LCDR Edward A. Davis (right) of Leola, Pa., by RADM F.P. Ballenger, MC, USN (left), CO of the National Naval Medical Center, Bethesda, Md. The people of Lancaster, Pa., sent the letter containing 500 messages of "Thank You," "Welcome Home," and "Congratulations."

The Videocassette - A Vast New Horizon for Medical Communication

Naval Medical Training Institute
National Naval Medical Center
Bethesda, Maryland 20014

For the past 14 months the Television Division of the Naval Medical Training Institute (NMTI) has been evaluating the capabilities of the ¾-inch videocassette. It now appears that the placement of cassette players in a number of hospitals and selected naval medical and dental dispensaries will establish a vast new network for Bureau communications and continuing medical education. For the first time the coronary care, emergency room, and intensive care departments at the National Naval Medical Center have completed teaching lecture series on videotape which are now available for demand viewing. Through two audiovisual carrels at the Stitt Library, medical personnel may also view televised programs produced by a variety of commercial sponsors. A monthly medical television series from the Network for Continuing Medical Education, a lecture series on neurology from the National Medical Audiovisual Center, and a program on surgical technique sponsored by the American Society of Abdominal Surgeons, are just a few of the widely increasing number of medical-teaching videotapes which are now available.

Under the guidance of RADM E.J. Rupnik, MC, USN (BUMED Code 4), former Commanding Officer of the Naval Medical Training Institute (NMTI), two television carrels and videocassettes were placed in the Stitt Library in an attempt to evaluate the usage and effectiveness of the television videocassette. "We knew for a long time that visual packages play a very important role in medical education," said LCDR T.W. Hard, MC,

Before the show can begin, video technician Clint Sexton checks out both color cameras.

Graphic artist, Carol Wills, is in charge of preparing all graphics that will be required for the production.

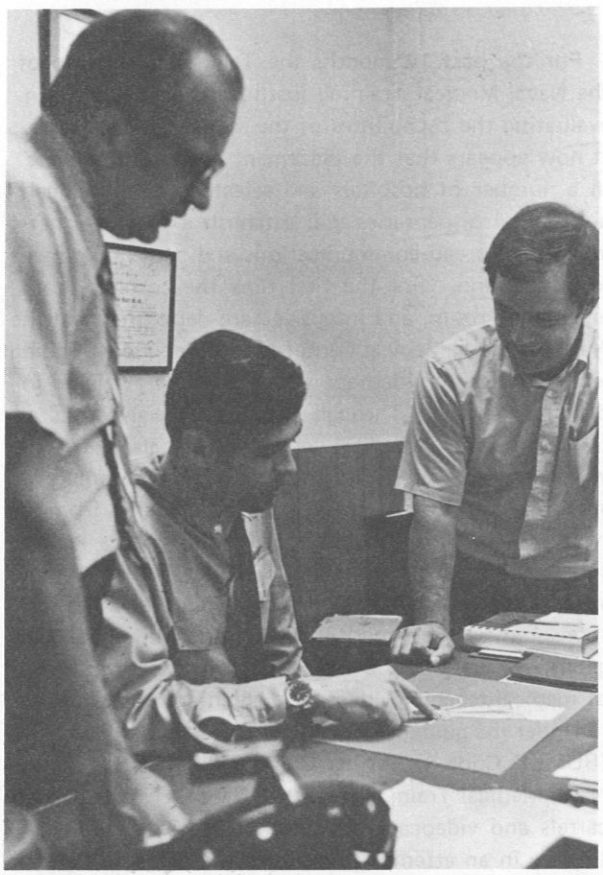
USNR, former Head, Media Department, NMTI,* "but initially the industry had to overcome two problems: an easy way of reviewing material, without having to set up a projector or bother with the difficulties of threading a film was required, and; secondly, there was a need to place the material in a quick, easy-to-view package which could be stored on a shelf for instant review. The videocassette has more than lived up to these expectations."

Initial evaluation by the Television Division, NMTI, has shown that the ¾-inch videocassette is economically more feasible than either 16-mm film or super-8-mm film cartridges. This concept has been so well received that the Media Steering Committee recently recommended the standardization of a wide variety of audiovisual material, to the videocassette format.

Efforts are now being made by the Film Division, NMTI, to evaluate the current mechanisms of film distribution; it is highly likely that the old 16-mm hospital film libraries may one day be replaced by a television set, a video playback machine, and a number of ¾-inch videocassettes.

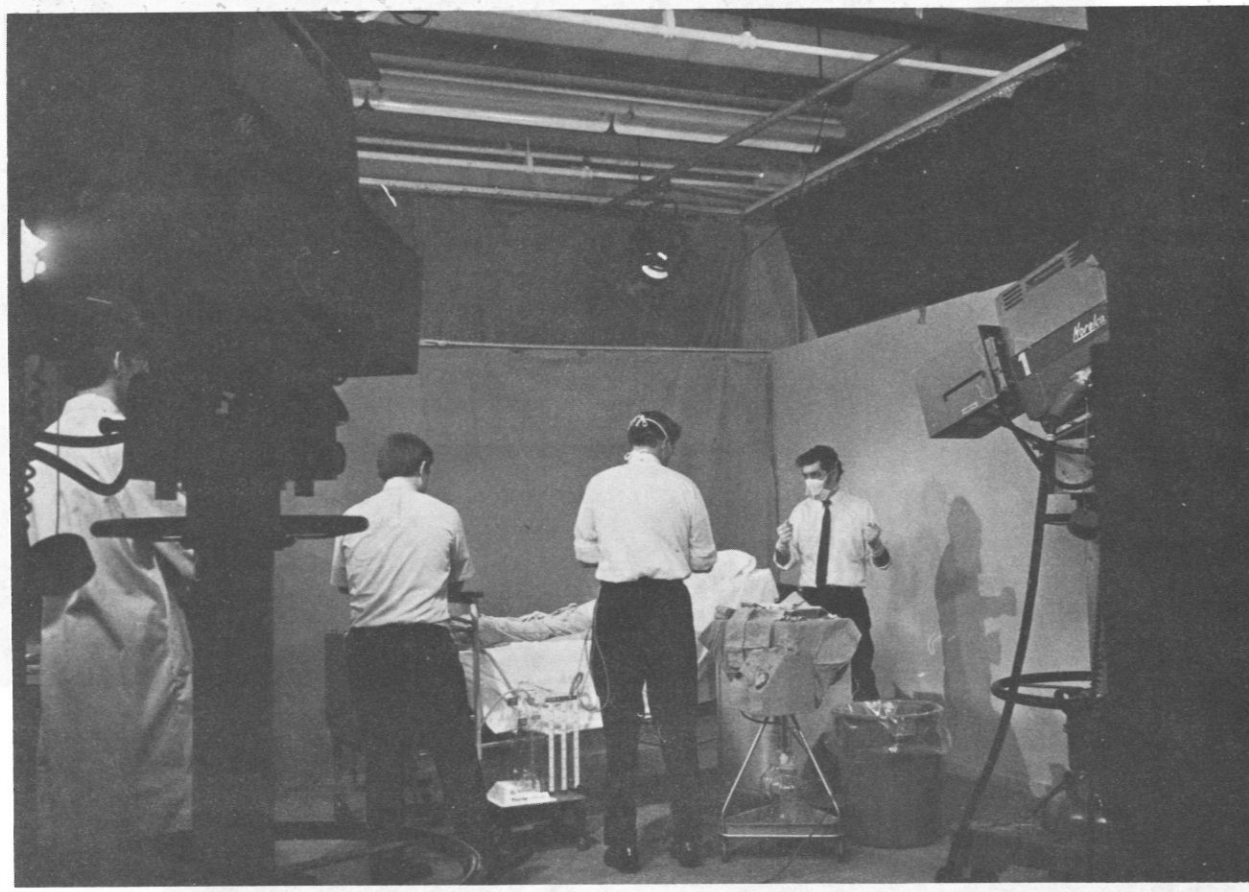
Over the past year the television studios at the NMTI have produced over 100 videotapes on current medical topics for continuing medical education. Studio programs are produced in color and are of professional broadcast quality. These videotapes can be readily duplicated and distributed to other naval facilities. "On location" black-and-white programs are also produced by utilizing a mobile television recording unit which allows for great flexibility in videotaping, in areas where studio production is not feasible. A pilot program for televising "situational reports" (Sit Rep) from the Bureau of Medicine and Surgery is now underway, utilizing these mobile units. In this manner briefing sessions, reports, and policy speeches may be recorded and distributed to target installations via the videocassette.

The first step in producing a program is a conference between the physician desiring the show, and Mr. Lani Waiwaiole, Head of the Production Branch. During the



LCDR Edward W. Hard, MC, USNR, former Head, Media Department (center), discusses an illustration that will be used in an upcoming show with Lou Ousborne (left), Head, Engineering Branch; and Lani Waiwaiole, Head, Production Branch.

*Dr. Hard was recently released from active duty. He is succeeded by Mr. Harry G. Zaritsky.



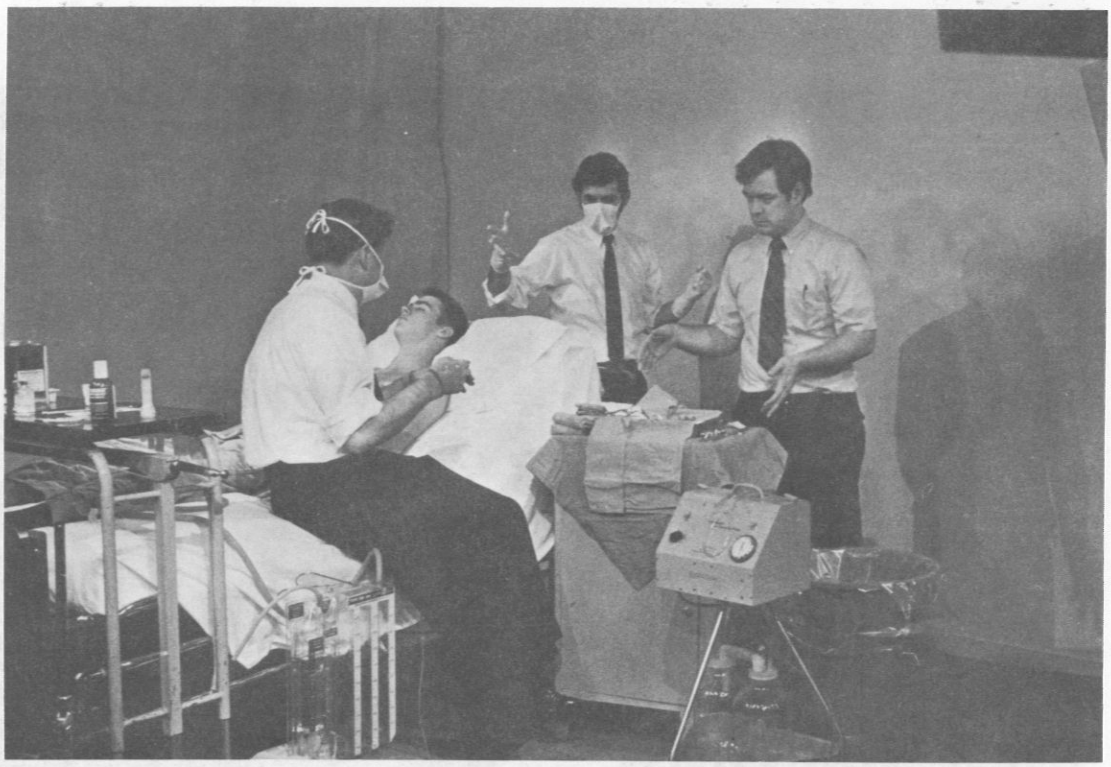
During the rehearsal, the director and doctors can discuss the most advantageous shots to present to the viewing audience.

initial meeting, Lani and the physician plan an approach to the show and select the visual aids to be used in support of the presentation. When this "groundwork" is completed, a shooting date is selected and the videotaping takes place. Since there is no processing time involved, and all editing is completed at the studio during the taping, a videotape presentation is usually completed and ready for distribution in one day.

The program may also be utilized for teaching at other naval medical facilities throughout the country. Three different formats are available to accommodate various types of equipment: 2-inch videotape, 16-mm color films, or ¾-inch videocassette.

One satisfied "customer," LCDR Myer Rosenthal, MC, USN, Head of Intensive Care at Naval Hospital, Bethesda, remarked, "Television has provided outstanding support of our teaching functions, and we use it constantly for training our personnel in the basic techniques. When we first established our intensive care unit, all our physicians, together, were urged to present lectures. Now we use videocassettes of these programs in the training of all new personnel."

When asked if the taped lectures would replace his instructors, Dr. Rosenthal replied: "Not really, but they're a tremendous help. In areas with a high personnel changeover rate, or continual training needs, they provide a foundation in knowledge of basic medical principles which we have found invaluable."



HN Gary Andrist (left), and HM3 Dan Stachurski (right) check out audiovisual equipment to be used in the production. Since the Navy has no NEC for television cameramen, corpsmen are trained for the position, the majority of the time in an OJT situation.

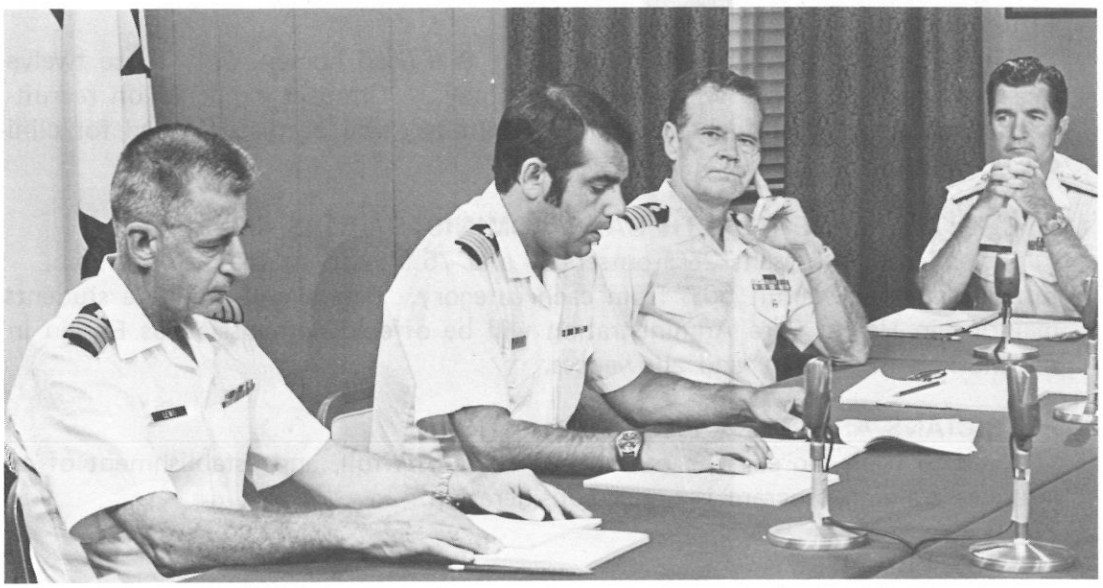
Videotape technician, Ralph Buonomo, adjusts the studio videotape recorder. All tape editing is done electronically on this machine.

Gary (left) and Lani (right) carefully double-check the finished show before it is transferred to videocassettes.

Lou Ousborne transfers the finished production to videocassette. This recorder, and others like it, have been placed in the Stitt Library so that medical personnel will be able to view medical tapes at their convenience.

RADM E.J. Rupnik, MC, USN (former CO of the Naval Medical Training Institute), and Nurse Sue Williams view videocassette in Stitt Library audio-visual carrels.

Taping of BUMED Sit Rep is accomplished by (from left to right): CAPT N.G. Lewis, MC, USN; CAPT M. Museles, MC, USN; CAPT E.L. Van Landingham, MSC, USN (hidden from view); RADM E.J. Rupnik, MC, USN; VADM D.L. Custis, MC, USN, Surgeon General; RADM H.S. Etter, MC, USN, Deputy Surgeon General; RADM J.P. Arthur, DC, USN; CAPT E.B. McMahon, MC, USN; and CAPT J.E. Wells, MSC, USN. (Photo by HM1 R. Simpkins, USN)



During taping of BUMED Sit Rep and not to be missed are (from left to right): CAPT Lewis, CAPT Museles, CAPT Van Landingham, and RADM Rupnik. (Photo by HM1 R. Simpkins, USN)

BUMED SITREPS

Monthly staff meetings in BUMED have been introduced by the Surgeon General to establish better communication, both internal and external to the Bureau. These meetings will be related to videotaped SITREPS that will be distributed to our medical commands throughout the world.

The field needs and wants information on what BUMED is doing. The concept of the whole health care team needs to be projected. Feedback on SITREPS is needed.

MEDICAL OFFICER RECRUITING

We are relatively inexperienced in recruiting because heavy reliance has previously been placed on the draft to bring physicians into the Navy. . . .now working closely with the Navy Recruiting Command, where there is a high level of enthusiasm for this program. The plan is to contact all physician levels, from premed through resident echelons.

FOX COMMITTEE REPORT

The VCNO directed that a study be conducted to analyze medical and dental officer billet requirements in the U.S. Navy. The committee reached three main conclusions:

1) That 362 medical officers and eight dental officers' billets could be eliminated without lowering present quality of health care.
2) That any further reduction would decrease the present level of health care, or cost the Navy more money.
3) That a four-officer group should be designated to develop manpower planning.

FROZEN BLOOD PROGRAM

Plans are being made to implement this program at Naval Hospitals Portsmouth, Va.; Bethesda; and Oakland.

FLIGHT PAY

Flight pay for pay grades 0-6 and above is a dead horse. Only those twelve 0-6s approved by VCNO will receive flight pay. . . .Impact expected on recruitment and retention of flight surgeons. Flight pay will be discontinued for clinical residents.

RECRUITMENT OF HEALTH CARE ADMINISTRATORS (MSCs)

Instead of the present 25% outservice and 75% inservice recruitment plan, future plan is to recruit 50% from each category. Senior and graduate students majoring in Health Care Administration will be offered commission as Ensign in the MSC, with full pay and allowances.

PHYSICIANS ASSISTANT PROGRAM

Need to train more. The outservice program is full, and establishment of an inservice training program is under consideration.

FAMILY PRACTICE

A fourth Family Practice Training Program is being established at NAV HOSP Charleston.

NATIONAL INTERN/RESIDENT MATCHING PLAN (NIRMP)

The Navy plans to continue this plan one more year. (The Army and Air Force have dropped this program.)

MEDICAL UNIT SELF-CONTAINED, TRANSPORTABLE (MUST)

Sea trials for the MUST taking place during Jul & Aug. . . .

FINANCIAL OUTLOOK

Financial outlook for FY 1974 is cloudy at best. Hearings by the House Appropriations Committee on the O & M account were scheduled to begin on 7/24 or 7/25.

We have identified over $25 million in unfunded requirements. Major claimants have submitted unfunded requirements in excess of $500 million to CNO. We must plan to live within available resources, and continue to seek what is further required.

Forecast on funding prospects is that no firm legislation will be passed before Thanksgiving.

REORGANIZATION OF NNMC BETHESDA

Sep 1 the requested effective date for: consolidating NNMC and NAV HOSP Bethesda, disestablishing NAV HOSP Bethesda, changing mission of NNMC Bethesda, and changing status of component activities to tenant activities. . . Change in effective date will allow for participation in planning and implementation of organization changes by new CO of NNMC.

OSD ON-SITE VISIT TO KEESLER AFB

Representatives of OSD, OPNAV, BUPERS and BUMED visited site 11-12 Jun. Keesler has a 350-bed hospital and has in the Military Construction (MILCON) Program proposal for a 75-bed addition for acute-care beds.

Transfer of Naval Home from Philadelphia to Biloxi anticipated in 1976. . . new location approximately 60 miles from new NAV HOSP New Orleans. This will create need for providing acute medical care to Naval Home residents, all of whom do not qualify as DOD beneficiaries. Two VA hospitals in the area are operating at 98% occupancy and cannot accept additional work load. A 60-bed geriatric nursing unit is planned for the Home and this will probably be staffed by Navy, independent of the Keesler Medical Center.

POSTOCCUPANCY VISIT TO NAV HOSP MEMPHIS

NAVFACENGCOM (Naval Facilities Engineering Command) and BUMED personnel conducted a postoccupancy evaluation during Jul. The committee was formed to determine if NAV HOSP Memphis is generally suited to the purpose for which it was designed, and to evaluate maintenance problems. Information gained in identification of problems and requirements will help to develop a preventive maintenance program for new medical facilities being constructed. Similar visits are planned for Oakland and Jacksonville in Aug and Sep, respectively.

OSD ON-SITE VISIT TO BREMERTON

Planned for 6-10 Aug, anticipating that Bremerton will need a new hospital in that area as a result of TRIDENT (super sub) program. This project will go into the FY 1976 MILCON Program.

NICE

To the Editor: Congratulations to the staff of *U.S. Navy Medicine* for being named a Merit Award Winner for the last three months of 1972. We are proud of your accomplishments. Internal information, we feel, is the key to success in public affairs. A well-informed internal audience is the foundation for successful external information and community relations programs.

This award highlights your talent and sincere endeavors to get the "word" out to all hands. You have complimented the field of journalism.

Again, congratulations on a job well done.

COL Walter N. Moore, Jr. USA
Commandant,
Defense Information School,
Fort Benjamin Harrison, Ind. 46216.

To the Editor: Since my retirement from active duty in 1953, I have savored each issue of *U.S. Navy Medicine.* It is not only beneficial to those of us in the allied professions, but each issue brings a fond nostalgia of some very pleasant memories as a part of the U.S. Navy.

The recent June issue is extremely good, in fact I am presently engaged in a similar project to that which is apparently being conducted at the Philadelphia Naval Hospital by Dunne and Parlette.

Heartiest congratulations on a job well done, as editor.

Neal-Dow Lenhart, MPH, Ph.D.
CWO, MSC, USN (Ret.)
Epidemiologist.
P.O. Box 325,
Woodbine, N.J. 08270.

BIOLOGIC AVAILABILITY OF DIGOXIN TABS

To the Editor: An article entitled "Lack of Equivalence of Digoxin Plasma Levels" by John G. Wagner, Ph.D., et al., was published in JAMA 224:199-204, Apr 9, 1973. After reviewing a preliminary version of Dr. Wagner's article, FDA accepted the opportunity extended to submit comments to JAMA for publication. The latter comments appeared as an Editorial on p. 243 of the same JAMA issue.

In the editorial, FDA provides recommendations for dealing with patients receiving oral digoxin therapy. The suggestions include the following:

1) Different brands of digoxin tablets reaching the marketplace may not be equally bioavailable, and therefore may not be therapeutically equivalent.

2) If unexpected difficulty is encountered in the digitalization of patients with digoxin tablets, the physician should consider the bioavailability of the tablet as a possible source of the problem.

The FDA is presently exploring the bioavailability of digitoxin, concerning which there has been little available information.

Arthur Ruskin, M.D.
Assistant to the Director for Medical Communications,
Bureau of Drugs,
Food and Drug Administration,
Rockville, Md.

CAPT HASTINGS PRAISED

To the Editor: As you undoubtedly know, CAPT Ben Hastings, MC, USNR (Ret.), former Director of the Division of Submarine and Radiation Medicine in BUMED has recently retired.

CAPT Hastings isn't just another captain fading into

retirement. He is the Navy's "Doctor Submarine," and has been for many years. The longer I work with submarines, the more I realize that he is literally a legendary figure among line and medical officer submariners.

I doubt that he wants much recognition, but earnestly believe that some tribute to him in *U.S. NAV MED* would be highly appropriate.

CDR W.B. Mahaffey, MC, USNR
Submarine Squadron FIVE
FPO San Diego, Calif.

We heartily concur in the praise of CAPT Hastings who will be greatly missed. We must take issue, however, with the reference to captains fading into retirement, Dr. Mahaffey. The older we get, the more we come to realize that captains don't fade into anything. They sail off full speed ahead, still charging. The illusory veil of moisture lies in the eye of the beholder, saddened by the loss. You will soon learn. Hang in there!

RADM WAITE EN ROUTE

To the Editor: We have just received our May 1973 issue of *U.S. NAV MED,* and as usual it is great! One thing puzzles us in your lead article on Navy Nurse Corps Directors, pages 5-11.

On page 6, Mrs. Higbee is referenced as the 2nd Superintendent, from 20 Jan 1911 until she was discharged on 30 Nov 1930 (a tenure of 19 years). Yet, J. Beatrice Bowman, the 3rd Superintendent, is said to have had the longest tenure from 1 Dec 1922 until 1 Jan 1935 (a tenure of 12 years).

One has to be incorrect or we had two superintendents from 1922 until 1930. See you in D.C.

RADM C.L. Waite, MC, USN
Fleet Medical Officer,
Commander in Chief U.S. Pacific Fleet
FPO San Francisco.

With admirable astuteness, the Admiral has detected an erratum for which we apologize. (See July issue, page 52) Mrs. Higbee was honorably discharged on 30 Nov 1922 (vice 1930).

NAVY IN DRAMATIC RESCUE

Navy personnel and civilians teamed up on 17-18 June in the dramatic recovery of a small, civilian research submarine which had become trapped while investigating the sea life around a scuttled ex-Navy destroyer 13 miles off Key West, Fla. Two of the sub's four-man crew survived the 31-hour ordeal which began when the midget submarine "Johnson Sea Link," belonging to the Smithsonian Institution, became entangled in debris from the ex-USS *Fred T. Berry (DD-858)* at about 1000 on 17 June, and ended when she was finally pulled free at 1652 the next day. The destroyer was sunk in May 1972 to serve as an artificial fishing reef.

Sea Link's mother ship sent a distress call to the Coast Guard, which requested assistance from the Navy. USS *Tringa (ASR-16)* was then sent to the scene. Mooring over the submarine, which was stranded at a depth of 351 feet, *Tringa* sent divers down in repeated attempts to reach the trapped vessel. The divers were hampered by 40-degree water temperatures and a 2.5 knot current, and were unable to reach the Sea Link. The mini-sub was finally recovered by the M/V A.B. *Wood,* a small 150-foot ship leased by the Fort Lauderdale Branch, Field Division of the Naval Ordnance Laboratory. A grapnel and line were fitted to a tethered, self-propelled, television-equipped sled carried in *Wood.* Guided from the surface by an Ordnance Lab electrical engineer, the sled was maneuvered down to Sea Link and the grapnel attached. *Wood* then pulled the sub clear of the debris, enabling her to surface.

Two of the submarine's crew were found to be in good condition after their ordeal, but the other two apparently died of carbon dioxide poisoning. Navy participants in the rescue effort included COMKEYWESTFOR, COMSUBRON 12, Supervisor of Salvage (NAVSHIPSYSCOM), the Experimental Diving Unit in Washington, D.C., USS *Amberjack (SS-522)* and a special roving-diving bell and diving team from COMSUBDEVGRU 1, flown to the scene from San Diego.—CHINFO NEWSGRAM (25-73).

Notes and Announcements

SHORT COURSE IN TROPICAL MEDICINE AT GORGAS MEMORIAL LAB

A short course in Tropical Medicine is given several times each year at the Gorgas Memorial Laboratory, Panama City, Panama.

Navy Residents or fellows who are in their senior-year level of training in Dermatology, Pathology, Pediatrics, and Internal Medicine and its related subspecialties, are eligible for nomination and selection. Priority shall be given to those residents and fellows who are in programs which have established this course as either an integral or an elective/integral part of that training program. Command nominations for other Medical Corps officers will be considered after all graduate medical training requirements have been accommodated.

Nominations shall be submitted in accordance with BUMEDINST 1520.8 series, BUMEDINST 4651.1 series or SECNAVINST 4651.15 series, whichever is applicable. The deadline date for receipt of applications for FISCAL YEAR 1975 is 15 May 1974. The Bureau of Medicine and Surgery, Code 316 will arrange for area clearances and registration for those medical officers selected for attendance. Therefore, it is requested that the below information be furnished on each nominee, at least 10 weeks prior to the convening date of the desired period of training.

a. Name, Rank, Corps, Social Security Number, File Number, and Designator.

b. Present status (e.g.: staff, resident, fellow, or other).

c. Specialty or subspecialty (e.g.: Internal Medicine, Hematology, Pathology, etc.).

d. Group Preference (Group numbers and convening dates will be published at a later date).

e. Mailing address of nominee.

f. Full name, relationship and address of NOK.—Code 316, BUMED.

NAVAL DISTRICT RESERVE PROGRAM REALIGNMENT

As part of the recently announced Navy shore establishment realignment, certain reserve activities are to be combined. It is expected that this amalgamation of Naval District functions will begin 1 Jul, and be completed by 31 Dec 1973. The Naval Reserve Supplements in COMONE, Boston, and COMFOUR, Philadelphia will be consolidated with COMTHREE at New York. COMFIVE, Norfolk, will combine with COMSIX, at Charleston, and the activities of COMTWELVE, San Francisco, and COMELEVEN, will be located at COMELEVEN in San Diego. There is no news of changes in the Eighth, Ninth, and Thirteenth Naval Districts.

For the information of those reservists affected by the realignment, your new District Medical Program Officers are:

THIRD NAVAL DISTRICT

LT Gerald E. ROETS, MSC, USN
Headquarters, THIRD Naval District, USSNF
Flushing & Washington Avenues
Brooklyn, New York 11251
AUTOVON: 456-2716/7/8
COMMERICAL/FTS NUMBER: (212) 625-4500

SIXTH NAVAL DISTRICT

LCDR Howard GARNER, MSC, USN
Headquarters, SIXTH Naval District
Naval Base
Charleston, South Carolina 29408
AUTOVON: 794-3771
COMMERICAL/FTS NUMBER: (803) 743-4322

ELEVENTH NAVAL DISTRICT

LT John L. KUBAL, MSC, USN
Headquarters, ELEVENTH Naval District
San Diego, California 92130
AUTOVON: 933-8742
COMMERICAL/FTS NUMBER: (714) 235-3742.—Code 36, BUMED.

NAVAL RESERVE (INACTIVE) SELECTION BOARDS

Fiscal year 1973 Naval Reserve (Inactive) Selection Boards have been scheduled to convene as follows:

RADM, MC	26 February 1974
CAPT, MC, MSC, NC	5 February 1974
CDR, MC, MSC, NC	5 February 1974
LCDR, MC, MSC, NC	29 May 1974
LT, MSC, NC	29 May 1974
WO	7 May 1974

Within the next several weeks, Naval District Commandants will be asked to nominate qualified Ready-Reservists to serve as Selection-Board members. Each nominee will have to meet the following criteria:

a. Be in an active (Ready-Reserve) status.

b. Be at least one grade senior in temporary rank to all officers who are to be considered by the Selection Board to which nominated. However, nominees for membership on the Warrant Officer Board must be serving in the permanent rank of Commander.

c. A nominee for Selection Board membership may not be a member of two successive boards for the consideration of officers for promotion to the same grade.

d. Must not have failed selection in *any grade.*

Reserve Medical Department officers who meet the foregoing criteria, and who feel they would like to be considered for board membership, should contact their respective District Medical Program Officers regarding nomination.—Code 36, BUMED.

BAQ FOR E-1 THROUGH E-4 RESERVISTS

Effective 1 Jul 1973, reservists in pay grades E-1 through E-4 (less than four years service), on ACDUTRA for less than 30 days, are entitled to Basic Allowance for Quarters (BAQ) at the same rates, and under the same conditions as members of the regular Navy. Rates of BAQ, and conditions of entitlements for other reservists, are not affected by this most recent change.—Code 36, BUMED.

TOPICS FROM THE TROPICS

HEAD-LICE OUTBREAK IN AN OVERSEAS SCHOOL

During late March and early April, an episode of *Pediculus humanus capitus* infestations occurred among students of a school complex in Taipei, Taiwan. U.S. government contract students (military and DOD civilian dependents), U.S. non-government-sponsored students and Chinese-national students were involved.

The first case was referred to the school nurse by a teacher who noted something crawling about the hair of one of her students. The school nurse recognized the problem as an infestation of head lice, promptly removed the student from school, and referred her with her parents to the U.S. Naval Hospital for treatment.

Examination of close associates of the first student, by the school nurse, revealed several other cases of infestation in the same class. Recognizing that widespread involvement throughout the school could rapidly ensue the nurse sought assistance, via the principal, from the Preventive Medicine Service at the U.S. Naval Hospital.

An inspection team was organized and inspected head and hair of all students and staff. Approximately 1,200 heads were examined, and a total of 44 infestations were discovered in the following distribution: High School, 2; Middle School, 5; Elementary School, 33; Kindergarten, 3; and Staff, 1. There were 33 females and 11 males involved.

All these cases, as well as non-student family members who were involved, received treatment with gamma benzene hexachloride, 1%. Following thorough application to all hair surfaces, the agent was left in contact for 18-24 hours; followed by scrupulous scalp cleanliness, brushing, and mechanical removal of adhering ova. Follow-up inspections of all cases were conducted, and no recurrences were observed.

An information bulletin on detection and prevention was provided to all students, families and staff. No additional cases developed.

Attempts to identify an index case were not successful, however, two modes of introduction appeared possible. First, *Pediculus humanus capitus* infestations are endemic in some population groups of Taiwan, and there is a good deal of interpersonal play-type contact between foreign and national children. Second, there was one newly arrived family with seven children, all of whom presented infestations most likely acquired in the U.S., or in transit to Taiwan. Either, or both modes of introduction appear likely.

Contributing factors, in the epidemiology of distribution were: the informal classroom arrangements,

wherein students sit around tables rather than at individual desks, and literally put their heads together in problem solving; infested siblings (16) were present in various classrooms; and the modern trend towards long hair introduced ready contact.

While the infested individuals presented no overt disease or secondary infections, obvious irritation, discomfort, and a certain degree of social stigmatization by peers and uninfested families was noted, despite efforts of medical personnel to preclude these developments.—LCDR Wayne A. Brown, MSC, USN; Environmental Health Officer and Chief, Preventive Medicine Service, U.S. Naval Hospital Taipei, Taiwan.

BELLY BOARD AWARD TO CDR R.B. JOHNSON

CDR Raymond B. Johnson, MC, USN, Assistant Head of the Gastroenterology Clinic and Research Branch at the Bethesda Naval Hospital, was presented with the fifth annual Belly Board Award on 22 June 1973, by Clinical Admiral-selectee William M. Lukash, MC, USN, Head of the Division. The award, previously given to surgeons and radiologists, recognizes outstanding

CDR Raymond B. Johnson, MC, USN (left) is presented with the fifth annual Belly Board Award by RADM-select William M. Lukash, MC, USN (right).

contributions to the development of Navy gastroenterology.

The Belly Board Conference, moderated by Dr. Johnson, has proved to be one of the more popular and effective teaching and working conferences currently existent at the hospital. In its informal nature it gains the interest of medical students, interns, residents, and staff members in an inter-disciplinary approach to the problems of digestive diseases.

Dr. Johnson was cited for the zealous manner in which he has conducted the conference over the past five years, eliciting total participation from all those attending. He has come to be known by his colleagues as a colorful and informed panelist at both local and national meetings in gastroenterology. In addition to 32 publications in national medical journals, he has also contributed to three books.

SEMINARS ON LEPROSY

The two-day and three-day seminars for 1973-74, listed below, have been scheduled by the Department of Health, Education and Welfare, Public Health Service at the U.S. Public Health Service Hospital in Carville, La. 70721.

LEPROSY-DERMATOLOGICAL ASPECTS	2-4 Oct 1973
(Senior Residents in Dermatology)	6-8 Nov 1973
	8-10 Jan 1974
	12-14 Mar 1974
	14-16 May 1974
	8-10 Oct 1974
	12-14 Nov 1974
(Military Dermatologists)	16-18 Oct 1973
LEPROSY-PATHOLOGICAL ASPECTS	23-24 Jan 1974
LEPROSY-NEUROLOGICAL ASPECTS	20-21 Feb 1974
LEPROSY-OPHTHALMOLOGICAL ASPECTS	27-28 Mar 1974

There are no registration fees or other costs assessed for any of these seminars. Lodging and meals for those attending will be provided on the Station. Commissioned officers who are receiving per diem will be charged the standard rate of $1.50 per meal.

Transportation to and from the originating point to the New Orleans International Airport is the responsibility of those attending the seminar. The hospital will furnish transportation between the New Orleans International Airport and Carville, a distance of 67 miles.

Further information can be obtained from: Chief, Training Branch, U.S. Public Health Service Hospital, Carville, Louisiana 70721.—Code 316, BUMED.

ANESTHESIOLOGY SYMPOSIUM

The Department of Anesthesiology at the Naval Hospital Portsmouth, Va., is sponsoring its Fourth Annual Anesthesiology Symposium, 6-9 Sept. This

symposium is a refresher course directed towards the continuing education of physician anesthesiologists.

Additional information can be obtained from CAPT W.M. McDermott, Jr., MC, USN, Chief of Anesthesiology Service, Naval Hospital Portsmouth, Va. 23708.

NEW SEC DEF

On 2 July 1973, James R. Schlesinger was sworn into office as the 12th Secretary of Defense. Prior to his nomination for this office he was the Director of the Central Intelligence Agency (CIA), since 2 Feb 1973.

Secretary Schlesinger was born in New York City on 15 Feb 1929. He graduated from Harvard University with a B.A. degree in 1950. He then earned his M.A. degree in 1952, and his Ph.D. degree at the same institution in 1956, in economics. From 1955-1963 he was an Associate Professor of Economics at the University of Virginia, and was the Academic Consultant in Economics to the U.S. Naval War College in 1957. He was also a consultant to the Federal Reserve Board of Governors during this period. Author of a book entitled "The Political Economy of National Security," he has written extensively on the role of systems analyses in relation to political decision-making.

Secretary Schlesinger was Director of Strategic Studies at the Rand Corporation in Santa Monica, Calif., from 1963-1969, where he specialized in strategic analysis with special reference to nuclear weaponry. While at Rand, he served as project leader of a study on nuclear proliferation which Rand undertook for the Federal Government. He was appointed Assistant Director of the Bureau of the Budget (BOB) in 1969, and later served as Acting Director of the Bureau during its transition to OMB (Office of Management and Budget). During this period he served as BOB representative on the Administration's Environmental Quality Council, which preceded the present Council on Environmental Quality.

Secretary of Defense James R. Schlesinger

Immediately prior to his directorship at CIA, Secretary Schlesinger was Assistant Director of the OMB, responsible for budget and management activities associated with national security and international programs. He also served as OMB's representative on the National Space Council, and was Chairman of the U.S. Atomic Energy Commission.

RADIATION HEALTH PROTECTION MANUAL

NAVMED P-5055 OF 4 MAY 1973

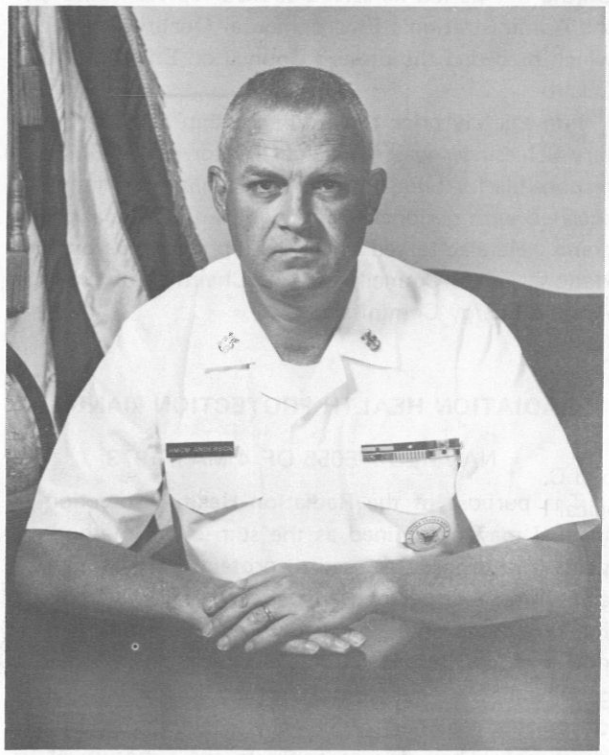
The purpose of the Radiation Health Protection Manual may be defined as the sum of all methods, plans, and procedures used to protect the health and environment of personnel from exposure to sources of ionizing radiation. The regulations contained in this document are intended for observance during peacetime by all naval activities possessing or utilizing sources of ionizing radiation which may affect the health of personnel. They do not apply to the exposure of individuals for diagnostic or treatment purposes.

In view of the increased use of radiation sources by naval activities, an extensive revision of the October 1964 edition of P-5055, the Radiation Health Protection Manual, was deemed necessary to maintain the continued effectiveness of the radiation health program. During the past decade, our knowledge of radiation hazard has improved considerably and this required many changes in the sections on definitions and radiation protection standards (Chapters 1 and 4). To improve the efficiency of detecting, reporting and maintaining radiation exposure records, in spite of an enlarged nuclear propulsion program and medical and research facilities, the sections on medical examinations, exposure records, and personnel dosimetry were also reorganized (Chapters 2, 5 and 6). The photodosimetry section was completely rewritten and an introduction to the use of thermoluminescent dosimeters was added.

This is a valuable manual, and one in which the Navy can take great pride.

HMCM ANDERSON NEW MASTER CHIEF PETTY OFFICER

Master Chief Hospital Corpsman Horace S. Anderson is the new Master Chief Petty Officer of the Navy Medical Department. He relieved HMCM Robert J. Swartout who recently retired from the naval service.



HMCM Horace S. Anderson

Prior to his selection by the Surgeon General to be the new MCPOC, Master Chief Anderson was Senior Enlisted Advisor to the Commanding Officer of the Naval Regional Medical Clinic in Washington, D.C. He was selected from among ten Master Chief Hospital Corpsmen and Master Chief Dental Technicians who were recommended for the post by a selection committee at the Bureau of Medicine and Surgery. The service records and careers of every E-9 in the Medical Department were evaluated in the selection process.

A veteran of over 25 years of naval service, Master Chief Anderson has served in a broad range of assignments ashore and afloat during his career. He has attended the following schools: Hospital Corps School, San Diego, Jul 1948; Fleet Marine Force, Camp Lejeune, Jun 1951; Aviation Medicine Technician School, NAS Pensacola, Feb 1954; Pharmacy Technician School, Portsmouth, Va., Aug 1960; Defense Language Institute, Naval Station Anacostia, Washington, D.C., (Portuguese), Jun 1965.

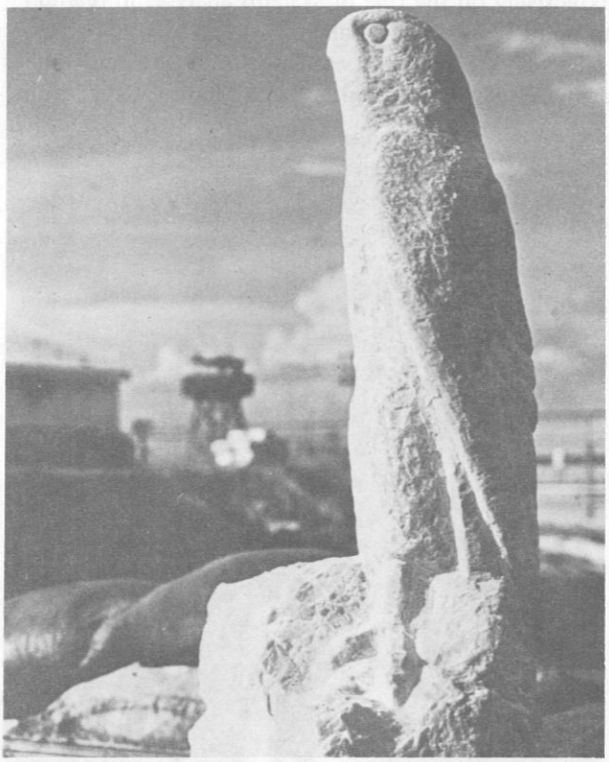
HMCM Anderson is entitled to the following awards: Presidential Unit Citation, Good Conduct Medal with Six Stars, Korean Presidential Unit Citation, Korean Service with One Star, United Nations Service Medal, and National Defense with One Star.

HMCM Anderson is to be congratulated for his recent selection and numerous accomplishments.

NEUROSURGEON SCULPSIT

CAPT Martin Plaut, MC, USN, Chief of Neurosurgery at Naval Hospital Charleston, S.C., was commissioned to sculpture a stylized falcon during his assignment as neurosurgeon at the former Station Hospital, NSA Da Nang, RVN, in the spring of 1969.

The sculpture was carved out of stone from "Marble Mountain," and symbolizes the spirit which prevailed at the medical facility. The objet d'art is now owned by Dr. B. Folweiler, a former anesthesiologist at the Station Hospital.



SPIRIT OF DA NANG 1969.—A stylized falcon carved out of stone from "Marble Mountain" symbolizes the spirit in which the former Naval Station Hospital, NSA, Da Nang, RVN rose to the challenge of providing medical support in that combat zone. (Photo reproduced from a color slide by HM3 L.R. Kennedy, USN.)

Thanks to HM3 L.R. Kennedy of the Medical Photography Laboratory at Naval Hospital Charleston, an accompanying photograph manages to capture the power of the falcon which stands 18 inches high and weighs 30 pounds.

ENS ETTER LAUNCHED

Harry S. Etter, Jr., was recently sworn into the Naval Reserve as an Ensign in the Armed Forces Health Scholarship Program. RADM Etter, the Deputy Surgeon General of the Navy and proud father of the new Ensign,

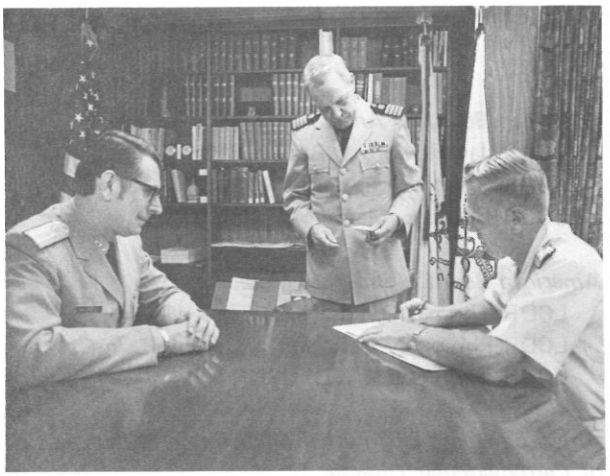
WELL DONE, SON.—RADM Harry S. Etter, MC, USN, (right), the Deputy Surgeon General of the Navy congratulated Harry S. Etter, Jr. (left), following his official commissioning as an ENS in the Naval Reserve. ENS Etter is participating in the Armed Forces Health Scholarship Program and will attend the University of Maryland Medical School.

administered the commissioning oath in his office at the Bureau of Medicine and Surgery.

A graduate of the New Mexico Institute of Mining and Technology in Socorro, New Mexico where he majored in biology, ENS Etter will attend the University of Maryland Medical School. As an Armed Forces Health Scholarship Program selectee his tuition, fees, books, supplies, and equipment will be provided, and he will receive $400.00 per month besides. His father, a veteran of almost 33 years service as a Navy medical officer, was promoted to flag rank in Oct 1966.

NATIONWIDE EVALUATION OF X-RAY TRENDS (NEXT)

In ceremonies held on 6 June 1973 in Rockville, Md., RADM Philip O. Geib, MC, USN, Assistant Chief for Research and Military Medical Specialties, and RADM



NAVY THE FIRST MILITARY PARTICIPANT.—Signing the interagency agreement to extend the Organ Dose Index System to X-ray installations under BUMED jurisdiction are (from left to right): RADM John C. Villforth, USPHS, Director of Bureau of Radiological Health; CAPT Andrew C. Wheeler, USPHS (center), Special Assistant to the Director; and RADM Philip O. Geib, MC, USN, Assistant Chief for Research and Military Medical Specialties, BUMED.

John C. Villforth, USPHS, Director, Bureau of Radiological Health (BRH), joined in signing an interagency agreement between BUMED and the Department of Health, Education and Welfare BRH, for joint participation in the Organ Dose Index System which is administered by the Food and Drug Administration (FDA). The Organ Dose Index System, which was developed in 1972 by the Task Force on Nationwide Evaluation of X-ray Trends (NEXT), is designed to evaluate the effectiveness of programs for reducing diagnostic X-ray exposure, and to obtain base line data on X-ray equipment-user techniques in order to formulate programs to correct deficiencies. The ultimate goal is to reduce unnecessary radiation exposure of both patients and operating personnel.

Under this agreement, FDA(BRH) will conduct training sessions on the Organ Dose Index System methodology for Navy personnel. The sessions will be held at either FDA facilities in Rockville, Md., or at BUMED facilities in Bethesda, Md. BRH will also supply survey kits and forms, process data, and prepare reports.

At the present time, 35 state radiological health agencies are participating in the Organ Dose Index System, with an additional ten states expected to join in 1973. The Navy is the first military service to participate in the program. The Air Force and Army are expected to join the system in the near future. Other participating groups include the Canadian Ministry of Health, the U.S. Public Health Service, U.S. Coast Guard, and the Bureau of Prisons.

AMERICAN BOARD CERTIFICATIONS

American Board of Anesthesiology
LCDR Jay Howard J. Brown, MC, USN
LCDR Brian G. McAlary, MC, USN
LCDR Frank E. Mack, MC, USNR

American Board of Internal Medicine
LCDR Thomas C. Farrell, Jr., MC, USNR
LCDR Philip Jay Feitelson, MC, USNR
LCDR Irwin Scher, MC, USNR

American Board of Internal Medicine in the subspecialty of Cardiovascular Disease
CAPT Dixon A. Lee, MC, USN
CDR Francis H. Corcoran, MC, USN
LCDR Charles Eastman Bemis, MC, USNR
LCDR Oscar A. Matthews, MC, USNR
LCDR Carl J. Pepine, MC, USN
LCDR Charlie W. Shaeffer, Jr., MC, USN
LCDR Mark E. Thompson, MC, USNR

American Board of Neurological Surgery
LCDR Lawrence H. Fink, MC, USN

Conjoint American Board of Nuclear Medicine
LCDR Frederick H. Gerber, MC, USN

American Board of Ophthalmology
LCDR Gary C. Graham, MC, USN
LCDR J. Louis Pecora, MC, USNR
LCDR Bruce D. Rasmussen, MC, USN

American Board of Otolaryngology
CDR Alexander L. Kesselman, MC, USN
LCDR Robert L. Tober, MC, USNR

American Board of Pathology in Anatomic and Clinical Pathology
LCDR Hing Yee Hung, MC, USNR
LCDR Harry L. Taylor, MC, USNR

American Board of Pathology in the subspecialty of Hematology
CDR Adelbert Devere Cramer, MC, USN

American Board of Pediatrics
LCDR Steven Aggeler Balch, MC, USN
LCDR Joseph M. English, III, MC, USN
LCDR Ronald L. Molloy, MC, USNR
LCDR John Hughes Senechal, MC, USN

American Board of Preventive Medicine in Aerospace Medicine
CAPT Richard J. Seeley, MC, USN
CDR Joe P. Smith, MC, USN

American Board of Preventive Medicine in Occupational Medicine
CDR Francis V. Viola, III, MC, USN

American Board of Psychiatry and Neurology in Psychiatry
CAPT Patrick F. O'Connell, MC, USN

American Board of Radiology
LCDR John A. Cavaluzzi, MC, USNR
LCDR Ira Silberman, MC, USNR

American Board of Radiology in Diagnostic Radiology
LCDR Ray Lynn Columbaro, MC, USNR
LCDR Richard A. Flom, MC, USNR
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LCDR Henry M. Meinecke, MC, USN
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LCDR John C. Sweeney, MC, USN
LCDR James R. Warden, MC, USN
LCDR Richard E. Welling, MC, USNR
LCDR John Robert Wesley, MC, USNR

American Board of Urology
CDR Norvelle Curry, MC, USN
CDR Lawrence A. Jones, MC, USN

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UNITED STATES NAVY MEDICINE

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NOTICES should be received not later than the third day of the month preceding the desired month of publication.

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